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SITE REMEDIATION REPORT ARMCO INC. SITE SANTA PE SPRINGS, CALIFORNIA

Prepared for:

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SITE REMEDIATION REPORT ARMCO INC. SITE SANTA PE SPRINGS, CALIFORNIA

1.0 INTRODUCTION

This report presents the results of a site cleanup effort at the former Armco Inc. facility (site) in the City of Santa Fe Springs, California (Figure 1). The work was conducted during the period 21 March 1988 to 13 May 1988, in response to the request and authorization of Stephen C. Jones, Esq. of the firm Jones, Day, Reavis, and Pogue, counsel to Crow Cal, Inc., environmental manager for the recent purchaser of the site. The property is planned for redevelopment as a distribution and research/development center consisting of four tilt-up buildings and parking lots.

Applied Geosciences Inc. conducted an environmental assessment of the property for Jones, Day, Reavis, and Pogue during the period of 11 July 1987 to 30 October 1987 and prepared an unpublished report dated 3 May 1988 (Applied Geosciences Inc., 1988). assessment consisted of: a historical background investigation; a regulatory review; a site walk/vicinity canvass; investigation comprised of an asbestos survey and the drilling of 18 borings, and 31 hand auger borings, including the collection and analyses of soil samples (Applied Geosciences Inc., 1988). In the judgment of Applied Geosciences Inc., there were four areas with soil having concentrations of petroleum hydrocarbons above background referred to in the report as: the North Area; the East Area; the South Area; and the Central Area (Figure 3). Two of the four areas (North and South Areas) contained elevated concentrations of select heavy metals in the near surface in to the petroleum hydrocarbons. Four registered underground storage tanks were also reported to be present on the site (Applied Geosciences Inc., 1988).

Recommendations for remediation discussed with the City of Santa Fe Springs included excavating the impacted soil and stockpiling the soil in segregated piles until a mitigation plan was generated. Aman Bros. Inc., Environmental Engineering (Aman), under the observation of Applied Geosciences Inc., conducted the excavation of degraded soil at the site, removed the underground storage tanks in accordance with the County of Los Angeles Department of Pubic Works (DPW) guidelines, and conducted soil sampling during the excavation. A closure report for the underground storage tanks removal, dated 28 April 1988, was prepared by Aman and submitted to the DPW (Aman Bros., Inc., 1988). Applied Geosciences Inc. conducted a subsurface soil investigation comprised of 10 borings to further assess the lateral and vertical extent of degraded soil in the North and Central Areas.

2.0 OBJECTIVE

The objective of the observations made and the work summarized in this report was to reduce the concentrations of petroleum hydrocarbons and metals in the surface and subsurface soils at the site by excavating the soil containing hydrocarbons and metals for later mitigation or disposal.

3.0 APPROACH

The approach used in this remediation effort included excavating soils containing elevated concentrations of petroleum hydrocarbons and heavy metals previously reported in Applied Geosciences Inc., 1988. Soil samples were collected grab fashion as well as from soil borings. In general, average criteria of 100 ppm total petroleum hydrocarbons and concentrations of metals below 10 times the Soluble Threshold Limit Concentration (STLC, as discussed in Section 5.2.1) were used to evaluate where mitigation was completed. The soil was segregated during excavation based on locations of the soil and field indications of the presence of hydrocarbons in the soil. Soil samples were collected and analyzed during the course of the excavation to assess whether the excavation was complete. The remedial action to date has not included mitigation or disposal of the excavated soil. The alternatives available for mitigation and/or disposal of the soil are presently under review.

4.0 SCOPE

The scope of services used to meet the objective has included the following:

- Excavation of the soil containing elevated concentrations of petroleum hydrocarbons and locally present select heavy metals above background concentrations;
- Excavation of soil containing elevated concentrations of petroleum hydrocarbons previously unknown which were discovered during the course of site grading;
- c Collection and analysis of soil samples remaining in the excavation following the completion of excavation by both an on-site State-certified mobile laboratory and a Statecertified laboratory;
- o Stockpiling the excavated soil on visqueen in segregated piles depending on the area from which the soil was excavated and/or constituents reported in the soil;
- Excavation of four registered underground storage tanks, and collection and analysis of soil samples from beneath the tanks in accordance with and under the supervision of the DPW;

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- o Drilling ten borings to further assess the vertical and lateral extent of degraded soil that may have been present in the North and Central areas; and,
- Data evaluation and report preparation.

5.0 DATA

5.1 Review of Toxic Hazard Assessment Report

An unpublished environmental assessment of the site prepared by Applied Geosciences Inc. (1988) reports the areas and estimated volumes of the soil containing elevated concentrations of petroleum hydrocarbons and heavy metals. The report identifies four areas of the site found to have impacted soil: the North Area; the East Area; the South Area; and the Central Area. The four areas were reported to contain soil with elevated concentrations of petroleum hydrocarbons. The North and South Areas were reported to contain select heavy metals in the near surface in addition to petroleum hydrocarbons (Applied Geosciences Inc., 1988).

The report also contains information on four registered underground storage tanks located on site (Applied Geosciences Inc., 1988) (Figure 2). These tanks had been registered with the DPW by Armco Inc. The first registered tank was a sump and was located south of the former Grind Central Department in the South Area. The second and third registered tanks were located in the Central Area (Figure 2). One of these was actually a clarifier located west of the former Heat Treating Department and the other was a kerosene tank located within the basement in the former Honing Department (Figure 2). The fourth registered tank was a sump and was located in the former Machine Shop II building in the East Area (Figure 2).

5.2 Excavating Soil and Soil Sampling

During the excavation of soil at the site, a State-certified mobile laboratory from Chemical Research Laboratory (CRL) of Stanton, California, was present to analyze soil samples to assess whether excavation could be considered complete. Samples of the soil during the excavation and remaining in the excavation were analyzed in the field by CRL for total petroleum hydrocarbons as an indicator, in general accordance with EPA Method No. 418.1. This analytical method was based on the results of previous analytical work which reported the hydrocarbons in the soil as a heavy fraction oil, which Method No. 418.1 is designed to detect. West Coast Analytical Service, Inc. (WCAS) of Santa Fe Springs is also a State-certified laboratory and was used to analyze some of the samples in more detail. Laboratory analyses included: Total Petroleum Hydrocarbons (TPH) in general accordance with EPA Method No. 418.1; Volatile Organic Compounds (VOC) in general accordance with EPA Method No. 8240; Fuel Hydrocarbons in general accordance with EPA Method No. 8015; and "CAM" (California Assessment

Manual) metals in general accordance with EPA Method No. 6020. These analytical methods were based on the results of previous analytical work which reported hydrocarbons, metals, and limited amounts of VOCs.

Degraded soil was excavated based on visual, olfactory, and analytical results. Excavation in the North and South areas continued to the property boundaries, where visual staining was observed in the near-surface soils. Excavated soil was stockpiled on visqueen and segregated in separate piles depending on constituents reported in the soil and/or area of origin.

5.2.1 North Area

The North Area was subdivided into two areas: North Area I and North Area II (Figure 3). North Area I consists of the area assessed by Applied Geosciences Inc. to have elevated concentrations of petroleum hydrocarbons and heavy metals (Applied Geosciences Inc., 1988). North Area II was an area of degraded soil not encountered during the toxic hazard assessment.

North Area I consisted of soil with concentrations of petroleum hydrocarbons and heavy metals (Applied Geosciences Inc., 1988). . The metals were present in the near surface and were limited to approximately 0 to 2 feet below the ground surface (BGS) (Applied Geosciences Inc., 1988). Beneath the soil with metals and hydrocarbons was soil containing elevated concentrations of petroleum hydrocarbons. Approximately 250 cubic yards of soil containing concentrations of heavy metals and petroleum hydrocarbons were excavated and stockpiled in a segregated pile. Soil samples were collected from the floor of the excavation and analyzed for CAM metals and TPH. Laboratory results indicate concentrations of "CAM" metals being below the Total Threshold Limit Concentration (TTLC) and less than ten times the STLC in the samples following excavation. The TTLC and STLC regulatory criteria used in evaluating whether a material containing a metal may be hazardous based on the concentrations of the metal. The laboratory results for TPH indicate a range from nondetectable concentrations to 88 parts per million (ppm) (Table 1 - Samples ARM22, ARM23, and ARM24).

Excavation of the soil containing concentrations of petroleum hydrocarbons continued following the excavation of the soil with hydrocarbons and metals. A thin layer of silty material, located approximately 15 feet BGS, was analyzed and reported to contain concentrations ranging from 577 ppm to 38,200 ppm TPH in the east section of North Area I. Sandy material located above and below the silty soil had low concentrations (14 ppm and 26 ppm) of TPH. This silt layer was later excavated; soil samples collected from the walls and floor of the excavation were reported to contain low concentrations (8 ppm) of TPH.

Three vertical pipes were encountered during the excavation. One was a former water well that Armco Inc. had abandoned prior to the completion of the environmental assessment (Applied

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Geosciences Inc., 1988). The second was an eight-inch diameter riveted pipe that was excavated to a depth of 18 feet BGS and removed. The third was a 10-inch diameter pipe with a welded cap, located adjacent to the abandoned well. Demolition crews tried pulling the 10-inch pipe out of the ground and found it to be a cover for an 8-inch pipe located within the 10-inch pipe. A tape measure was dropped down the pipe and the pipe was approximately 22 feet deep (27 feet BGS). No odor or visual staining was encountered on the tape measure or surrounding the pipe. Visual and olfactory evidence of hydrocarbons were not found beneath a depth of four feet BGS in the vicinity of the pipe. Seven to eight bags of cement slurry were poured into the pipe for abandonment purposes. The 8-inch pipe was cut at approximately 10 feet BGS and continued to be filled with slurry cement to "overfill" the pipe.

Approximately 1,400 cubic yards of soil with elevated concentrations of petroleum hydrocarbons was excavated from North Area I and stock piled in segregated piles. The degraded soil in North Area I was excavated up to the north property line where some subsurface staining was observed along the approximate property line. Soil samples were collected from the floors and walls of the excavation onsite and analyzed for TPH. Laboratory results for TPH of soil remaining onsite in the excavation indicate an average concentration of 40 ppm, ranging from non-detectable concentrations to 140 ppm (Figure 4) (Table 1).

North Area II consisted of soil containing elevated concentrations of petroleum hydrocarbons first observed during excavation. The impacted soil was found during demolition of the buildings and excavation of North Area I.

Three subsurface structures which were interpreted by Applied Geosciences Inc. to be "dry wells" were discovered during excavation of North Area II; these were constructed of red bricks with approximate circular diameters of three feet (Figure 4). The tops of the dry wells were located approximately two to 10 feet BGS, with total depths ranging from 31 to 32 feet BGS. Other items encountered included: a dry well constructed of natural soil, with a circular diameter of three feet and depth from five feet to 10 feet BGS; two brick box structures located five feet and 30 feet BGS; a dry well/french drain structure constructed of brick fragments, gravel, and rocks with a depth of two to five feet BGS; and a ceramic circular structure with a diameter of one foot and depth ranging from one to six feet BGS (Figure 4). A former employee who used to work at the facility during the 1950's indicated the dry wells were used to heat treat steel pipes prior to construction of the Heat Treating Department (MacLean, 1988).

A large volume of degraded soil was observed around the dry wells and the other subsurface features in this area. A soil sample (ARM69) was collected at a depth of approximately 12 feet BGS and analyzed for VOCs and TPH. The sample was reported to contain low concentrations of VOCs (0.019 ppm of carbon disulfide and

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0.033 ppm of tetrachloroethylene) and elevated concentrations (8,000 ppm) of a heavy fraction hydrocarbon similar to what had been found elsewhere on the site. Based on this sample and other samples used to profile the soil for waste disposal purposes, it was the judgment of Applied Geosciences Inc. that the soil contained mostly oil and EPA Method No. 418.1 could be used as an indicator in this area as well. Each of the eight structures were excavated as was the degraded soil; soil samples were collected and analyzed for TPH from the walls and floors of each excavation area.

Soil samples were collected from the floors and walls of the excavation and analyzed for TPH where visual or olfactory evidence of degraded soil was no longer present. Laboratory results of soil samples collected following the excavation of degraded soil and analyzed for TPH indicate concentrations ranging from 5 ppm to 140 ppm (Table 2) with three samples reported to contain 242 ppm, 326 ppm, and 370 ppm from three small localized areas in the excavation. Soil samples collected from soil adjacent to these localized areas were analyzed and indicate low concentrations of TPH remaining in the soil ranging from 12 to 80 ppm. No visual staining or odors were observed in these areas. These areas are of very limited extent and anomalous in our judgment.

Approximately 5,000 cubic yards of degraded soil was excavated from North Area II and stock piled in segregated piles. The average concentration of the samples of the soil remaining in the North Area II excavation is approximately 58 ppm (Figure 4A).

During site excavation of North Area II, the excavation came close to the tilt-up building located along the north property line (Figure 4). Due to possible unstable soil conditions and unsafe working conditions, it was the judgment of Applied Geosciences Inc. not to continue excavation of the degraded soil adjacent to the building. Three borings (ARM25, 26, and 27) were drilled adjacent to the north property line to further estimate the vertical and lateral extent, if any, of degraded soil present on site (Figure 4). The borings were drilled to an approximate depth of 51.5 feet BGS and soil samples were collected and analyzed for TPH. Three samples were analyzed per boring and laboratory reports indicated concentrations ranging from nondetect to 23 ppm in the soil samples (Table 3).

Applied Geosciences Inc. (1988) also reported a small surfical area adjacent to hand auger boring AHB12 that contained elevated concentrations of petroleum hydrocarbons (Figure 2). Prior to soil excavation, one soil sample was collected and analyzed for TPH and reported to contain a concentration of 614 ppm. Approximately 2 cubic yards of soil were excavated and one soil sample was collected from the bottom of the excavation and analyzed for TPH following excavation (Figure 3). Laboratory results indicate low concentrations (44 ppm) of TPH in the sample.

5.2.2 East Area

Soil with concentrations of petroleum hydrocarbons in the East Area, as described in the environmental assessment report prepared by Applied Geosciences Inc. (1988), was estimated to consist of approximately 35 cubic yards (Figure 2). Two soil samples were collected and analyzed for TPH and reported to have concentrations of 302 ppm and 237 ppm. The degraded soil described in the assessment report was disturbed during the demolition of the east parking lot and during construction of two tilt-up buildings located approximately one foot east of the property line. Due to the disturbance of this area, the low concentrations of petroleum hydrocarbons reported in the soil samples, and no visual staining or odor of the soil, soil was not excavated from the East Area.

5.2.3 South Area

The soil in the South Area was reported to contain concentrations of petroleum hydrocarbons and heavy metals (Applied Geosciences Inc., 1988) (Figure 2). Approximately 100 cubic yards of soil containing concentrations of petroleum hydrocarbons and heavy metals were excavated and stockpiled in a segregated pile. excavation continued with soil containing concentrations of petroleum hydrocarbons. Degraded soil was excavated up to the property line where a small amount of visual staining was observed. Approximately 1,000 cubic yards of degraded soil were excavated and stockpiled in segregated piles. Soil samples were collected from the floors and walls of the excavations and analyzed for TPH (Figure 5). Laboratory results of samples collected from walls and floors indicate low concentrations of TPH ranging from 3 ppm to 147 ppm remaining in the soil samples collected from the South Area (Table 4). The average concentration of TPH in the samples from the excavation is 25 ppm.

5.2.4 West Area

Previous field work conducted by Applied Geosciences Inc. did not encounter degraded soil in the West Area (Applied Geosciences Inc., 1988). During the geophysical survey of the west parking lot, conducted by Applied Geosciences Inc. (1988), an anomaly was discovered. A boring was drilled to a depth of approximately 16.5 feet BGS adjacent to the anomaly and one soil sample was collected at a depth of 10 feet BGS and analyzed for TPR. Laboratory reports indicated low concentrations (12 ppm) of TPH (Applied Geosciences Inc., 1988).

During demolition and excavation of the West Area, two structures which appeared to be "dry wells" were discovered in the area of the anomaly and the previous boring (Figure 3). The dry wells were constructed of red brick, with circular diameters of three feet. The tops of both wells were located approximately two feet BGS, reaching a depth of approximately 18 feet BGS. The wells were connected with a four-inch diameter pipe located 000009

approximately two feet BGS. One of the wells was observed to have slightly stained bricks, whereas the second well looked as if it had never been used. The wells were excavated and one soil sample was collected from the floor of the excavation at approximately 18 feet BGS and analyzed for TPH. Laboratory reports indicate the soil sample having nondetectable concentrations of TPH. No soil discoloration or odors were observed during excavation.

During further grading operations on 26 April 1988, three more "dry wells" were discovered at a depth of approximately three feet BGS (Figure 3). The bricks in the three wells were observed to be slightly stained. These structures were constructed of red brick and had circular diameters of approximately 2.5 feet. The first well had caved in due to earth movement caused by heavy equipment; therefore, it was excavated to assess the vertical extent and was found to be approximately 16 feet deep BGS. Soil samples were collected and analyzed for TPH at approximately 8 and 16 feet BGS. Laboratory reports indicate low concentrations (17 ppm and 12 ppm) of TPH. No soil discoloration or odors were observed during excavation. The remaining wells were undisturbed and had a depth of approximately 15 and 21 feet BGS. One boring was drilled adjacent to each of the two remaining dry wells so soil samples could be collected and analyzed for TPH. Soil samples were collected at 8 and 16 feet BGS for the well with a depth of 15 feet BGS; and samples were collected at 10 and 22 feet BGS for the well with a depth of 21 feet BGS. Laboratory reports indicated nondetectable concentrations of TPH for three of the four soil samples analyzed. The fourth soil sample, located at 16 feet BGS, was reported as having a low concentration (4 ppm) of TPH.

5.2.5 Central Area

The soil in the Central Area was reported during Applied Geosciences Inc.'s initial assessment to have concentrations of petroleum hydrocarbons present (Applied Geosciences Inc., 1988) (Figure 2). One area of soil containing petroleum hydrocarbons was located at a shallow depth (approximately 4 to 17 feet BGS) below a former sump in the test pit area (Figure 2). The other area was reported to be at depth (approximately 48 feet BGS) below the test pits. During demolition of the Hydraulic Assembly Department, demolition crews excavated the test pits and the degraded soil at shallow depths. The soil was stockpiled adjacent to the excavation and later two soil samples were collected from the stockpiled soils and analyzed for TPH. of the samples was reported to contain low concentrations (29 ppm) of TPH and the other sample was reported to contain elevated concentrations (31,400 ppm) of TPH. The stockpile containing elevated concentrations of TPH was removed and restockpiled on visqueen plastic in a segregated pile. A soil sample was collected and analyzed for TPH from the area at which the stockpile was located to assess the concentration of TPH in the remaining soil. The soil sample contained low concentrations (11 ppm) of TPH. 000010 Four vertical borings (ARM19, 20, 21, and 22) and three slant borings (ARM23, 24, 28) were drilled to an approximate depth of 50 feet BGS surrounding the area where degraded soil was present at depth. The borings were drilled to further assess the vertical and lateral extent of the degraded soil in this area.

The soil containing elevated concentrations of petroleum hydrocarbons located at depth was excavated and stockpiled in segregated piles (Figure 6). The degraded soil was first encountered at 25 feet BGS and continued down in a "cone shape" to an approximate depth of 69 feet BGS. The concentration of hydrocarbons detected decreased with depth. Soil samples were collected from the floors and walls of the excavation and analyzed for TPH to assess the limitations of the degraded soil. Soil remaining within the excavation was analyzed and reportedly ranged from 3 ppm to 22 ppm (Table 5) (Figure 6A). Groundwater was not encountered during the excavation.

Three areas were observed to contain soil with concentrations of petroleum hydrocarbons in the shallow subsurface ranging from 0 to 5 feet BGS during the previous field investigation (Applied Geosciences Inc., 1988). The areas were located east of the former Honing Department, east of the former Heat Treating Department, and west of the former Heat Treating Department adjacent to a registered underground storage tank (discussed in Section 5.3.3) (Figure 2). During demolition of the area east of the Honing Department, the area with degraded soil was excavated. One soil sample was collected from this area and analyzed for TPH. Laboratory analyses indicated low concentrations of TPH in the soil sample (212 ppm).

One soil sample was collected from the area east of the Heat Treating Department and analyzed for TPH. Laboratory analyses indicated elevated concentrations (4,140 ppm) of TPH were present in the soil. Approximately 50 cubic yards of degraded soil were excavated and stockpiled in segregated piles following the original sampling. Two soil samples were collected from the floor of the excavation and analyzed for TPH following excavation. The laboratory report indicates that low concentrations (24 ppm and 140 ppm) of TPH were present in the remaining soil.

5.3 Registered Underground Storage Tanks

Applied Geosciences Inc. observed removal of the four registered underground tanks (Figure 2) by Aman Bros., Inc. under supervision of Mr. Jerry Wong, Senior Industrial Waste Engineer for the DPW. Mr. Wong instructed Aman to collect one soil sample from a depth of four feet below each underground tank and analyze the sample for constituents contained within the tank (Vossler, 1988). WCAS analyzed the four soil samples for TPH in general accordance with EPA Method No. 418.1; three of the four samples were analyzed for "CAM" metals in general accordance with EPA Method No. 6020; and two of the four samples were analyzed for

VOCs in general accordance with EPA Method No. 8240. Aman submitted an underground storage tank closure report to DPW dated 28 April 1988.

5.3.1 East Area

One of the four registered underground storage tanks was located inside the former Machine Shop II (Applied Geosciences Inc., 1988) (Figure 2). This registered tank was actually a concrete sump that formerly held cutting oils. The sump was removed and soil sample was collected approximately 9 feet (approximately four feet below the bottom of the sump) analyzed for TPH and "CAM" metals. Low concentrations of "CAM" metals and an elevated concentration (19,000 ppm) of TPH were reported in the sample. Mr. Wong suggested excavating the remaining degraded soil and collecting and analyzing a soil sample from the bottom of the excavation (Vossler, 1988). Approximately 100 cubic yards of soil were excavated and stock piled in a segregated pile. One soil sample was collected from the floor of the excavation, at approximately 18 feet BGS, and one soil sample was collected from the south wall of the excavation, at approximately 10 feet BGS, and analyzed for TPH. The laboratory results for the two samples indicated low . concentrations of TPH (25 ppm and 46 ppm, respectively).

5.3.2 South Area

The registered tank located in the South Area was a sump located south of the former Grind Central Department (Applied Geosciences Inc., 1988) (Figure 2). The sump was excavated and a soil sample was collected approximately four feet below the bottom of the sump. The laboratory analyses included TPH, VOCs, and "CAM" metals. Nondetectable concentrations of VOCs and low concentrations of "CAM" metals (below the TTLC and below ten times the STLC) and TPH (48 ppm) were reported in the soil sample.

5.3.3 Central Area

The clarifier located west of the Heat Treating Department was excavated by demolition crews during demolition of the site (Figure 2). A soil sample was collected and analyzed for TPH, VOCs, and "CAM" metals in the approximate location of the former clarifier, as specified by the DPW (Vossler, 1988). Low concentrations of TPH (27 ppm) and "CAM" metals (less than ten times the STLC) were reported. Nondetectable concentrations of VOCs were reported in the soil sample.

A second registered underground storage tank was located in the basement of the former Honing Department (Applied Geosciences Inc., 1988) (Figure 2). The storage tank was excavated and a soil sample was collected approximately 4 feet below the tank as specified by the DPW. The soil sample was analyzed for TPH and reported to contain low concentrations (21 ppm).

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6.0 DISCUSSION

6.1 North Area

The North Area had three areas of degraded soil: North Area I had soil containing concentrations of petroleum hydrocarbons and heavy metals; North Area II had soil containing concentrations of petroleum hydrocarbons; and the third area had soil with concentrations of petroleum hydrocarbons (Figures 2, 3, and 4).

The soil containing petroleum hydrocarbons and heavy metals was first excavated from North Area I and stockpiled in a separate pile. Excavation of soil with elevated concentrations of petroleum hydrocarbons continued in the North Area following excavation of the soil with metals. Three vertical pipes were discovered during excavation. One was the former water well that was previously abandoned by Armco and the other two were of unknown origin. One of the two was excavated and the other was cut below grade and abandoned by filling with cement slurry. Thirty six soil samples were collected from the floors and walls of the excavation in North Area I and analyzed for TPH during excavation to assess the concentration of the petroleum hydrocarbons remaining (Figure 4 and 4A). Table 1 indicates concentrations of TPH left in the soil of the excavation ranging from nondetect to 140 ppm, with an average of 40 ppm.

soil containing elevated concentrations petroleum hydrocarbons in North Area II was excavated and stockpiled in a separate pile. During excavation of North Area II eight objects were encountered including: four "dry wells" constructed of red bricks; two square brick structures; one dry well constructed of natural soil; one dry well constructed of ceramic material; and dry well/french drain consisting of broken bricks, gravel rocks (Figure 4). These structure and the degraded soil and surrounding the structures were excavated; 53 soil samples were collected during excavation and analyzed for TPH to assess the concentrations of the petroleum hydrocarbons remaining following excavation (Figure 4 and 4A). Table 2 indicates concentrations of TPH left in the soil of the excavation ranging from 5 ppm to 370 ppm, with an average of 58 ppm.

It was the judgment of Applied Geosciences Inc. not to continue to excavate North Area II close to the tilt-up building located north of the site due to safety reasons and possible structural damage. Excavation continued up to the property line where stained soil was observed in the subsurface soils. Three borings were drilled adjacent to the excavation and tilt-up building to assess the vertical and lateral extent of the impacted soil, if any, left in place (Figure 4). Soil samples were collected from the borings and analyzed for TPH. Table 3 indicates concentrations of TPH left in the soil of the excavation ranging from nondetect to 23 ppm, with an average of 19 ppm. It is the judgment of Applied Geosciences Inc. that the volume of impacted soil left in place is very minimal, if any.

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প্ৰাৰ্থ কৰিছে । প্ৰাৰ্থ কৰিছে A small area located adjacent to the north property boundary had elevated concentrations of petroleum hydrocarbons (Figure 2). The soil from this area containing elevated concentrations was excavated and soil samples were collected and analyzed for TPH.

The concentrations of TPH detected in the samples collected from the soil remaining in the North Area were low and would not be considered hazardous or require mitigation under current regulatory guidelines. Therefore, it is the judgment of Applied Geosciences Inc. that no further excavation or other remedial action would be warranted in the North Area.

6.2 East Area

There were two areas of soil containing hydrocarbons in the East Area. One area of concern was the east property boundary where near surface soil containing elevated concentrations of petroleum hydrocarbons were observed during investigation (Applied Geosciences Inc., 1988) (Figure 2). Soil samples collected and analyzed for TPH reportedly contained low concentrations. During demolition processes at the site and/or during construction of tilt-up buildings located approximately one foot east of the property boundary the soil was moved/mixed. Samples collected during this investigation were reported to contain low concentrations of TPH ranging from 237 to 302 ppm.

The second area of concern was the soil containing elevated concentrations of petroleum hydrocarbons located beneath the registered underground tank (Figure 2). This soil was excavated and stockpiled; soil samples collected and analyzed for TPH reportedly contained low concentrations; and a closure report was prepared and submitted by Aman to the DPW (Aman Bros., Inc., 1988).

Soil samples collected and analyzed from the East Area were reported to contain low concentrations of TPH (46 to 302 ppm) and would not be considered hazardous under current regulatory guidelines and would pose little or no environmental impact in our judgment. Therefore, it is the judgment of Applied Geosciences Inc. that no further excavation or other remedial action is warranted for the East Area.

6.3 South Area

The two areas of concern in the South Area consisted of: the soil containing concentrations of petroleum hydrocarbons and heavy metals; and the registered underground storage tank (Figure 2). The soil containing elevated concentrations of petroleum hydrocarbons and heavy metals was excavated first and stockpiled in a segregated pile. Soil containing elevated concentrations of petroleum hydrocarbons was then excavated and stockpiled (Figure 5). The degraded soil was excavated up to the south property line where staining was observed along the property line. During excavation 23 soil samples were collected from floors and walls of the excavation and analyzed by a mobile laboratory for TPH to

assess the concentrations remaining in the soil (Table 4). The concentrations detected were low, ranging from 3 ppm to 147 ppm with an average concentration of 25 ppm.

The underground storage tank registered with the DPW was excavated and soil samples were collected and analyzed for TPH, VOCs, and "CAM" metals. Laboratory results of the soil samples collected were reported to contain low concentrations of TPH and "CAM" metals and nondetectable concentrations of VOCs. An underground storage tank closure report was written and submitted by Aman to the DPW (Aman Bros., Inc., 1988).

Soil samples analyzed in the South Area were reported to contain low concentrations of TPH and would not be considered hazardous or require mitigation under current regulatory guidelines. Therefore, it is the judgment of Applied Geosciences Inc. that no further excavation or other remedial action would be warranted in the South Area.

6.4 West Area

During grading operations at the site, five dry wells were discovered in this area (Figure 3). Three of the structures were excavated and two borings were drilled adjacent to the remaining wells. Soil samples were collected from floors and walls of the excavation and analyzed for TPH. Laboratory results from soil samples collected in the West Area indicated low concentrations of TPH ranging from nondetect to 10 ppm. Therefore, it is the judgment of Applied Geosciences Inc. that no further excavation or other remedial action would be warranted in the West Area.

6.5 Central Area

There were five areas of soil containing elevated concentrations of petroleum hydrocarbons located in the Central Area (Applied Geosciences Inc., 1988). Three of the five areas were disturbed during demolition of the site facility. These areas include: shallow subsurface soil located east of the former Honing Department; the shallow subsurface soil located south of the former Hydraulic Assembly Department, adjacent to the sump in the test pit area; and the clarifier, located east of the former Heat Treating Department (registered as an underground storage tank) (Figure 2). Soil samples were collected from these areas and analyzed for TPH. Laboratory results indicate low concentrations of TPH in the samples of the remaining soil, ranging from 24 ppm to 212 ppm. An underground storage tank closure report for the clarifier was submitted by Aman to the DPW (Aman Bros., Inc., 1988).

Two of the five areas which had been identified in the initial assessment as having degraded soil that were not disturbed during demolition, included the area east of the former Heat Treating Department and the soil beneath the test pits in the former Hydraulic Assembly Department (Figure 2). Degraded soil from both areas was excavated and stockpiled in segregated piles.

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Approximately 24 soil samples were collected during excavation and analyzed for TPH to assess the concentration of soil containing petroleum hydrocarbons remaining following excavation. The concentrations detected in both areas were low (5 to 22 ppm) and would not be considered hazardous or require mitigation under current regulatory guidelines. Therefore, it is the judgment of Applied Geosciences Inc. that no further excavation or remedial action would be warranted in the Central Area.

7.0 CONCLUSIONS

Based on the data presented in this assessment, current regulatory guidelines, and our professional judgment, the following conclusions have been made:

- o The soil containing elevated concentrations of petroleum hydrocarbons and heavy metals has been excavated from the site;
- Excavated soil is presently stockpiled on visqueen plastic and segregated on the basis of constituents in the soil and areas in which the soil was excavated;
- o The concentrations of petroleum hydrocarbons and "CAM" metals detected in the samples of the soil remaining in the excavations are below criteria used to classify soil as a hazardous waste based on current regulatory criteria and would not require further mitigative actions in our judgment;
- o Four registered underground tanks on the site were removed and soil samples were collected and analyzed under supervision of the DPW;
- o Based upon the initial investigation and the investigation conducted during demolition/excavation of the site, no source was discovered on-site which would likely have impacted or contribute to degradation of groundwater and there is a low likelihood that such a source exists.

9.0 REFERENCES

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- Aman Bros., Inc., 1988, Underground Storage Tank closure Report, unpublished report prepared for the County of Los Angeles Department of Public Works Waste Management Division, 2 p.
- Applied Geosciences Inc., 1988, Toxic Hazard Assessment Conducted at the Armco Inc. Facility in the City of Santa Fe Springs, California, unpublished report prepared for Crow Cal. Inc., Los Angeles, California, 23 p.
- MacLean, A., 1988, Unocal Corporation, Senior Production Engineer, oral communications.
- Vossler, D., 1988, Aman Bros., Inc.-Environmental Engineers, Vice President, oral communications.

TABLE 1

SAMPLES COLLECTED FROM SOIL FOLLOWING EXCAVATION

NORTH AREA I EXCAVATION (Figure 4)

sample Designation ¹	SAMPLE LOCATION ²	DEPTH ³	TPH4	
ARM22	FLOOR	3	50	
ARM23	FLOOR	2	88	
ARM24	FLOOR	2	ИD	
ARM25	FLOOR	2 2 2 4	81	
ARM26	FLOOR	15	ИĎ	
ARM27A	FLOOR	5 .		
ARM28	FLOOR	š .	5 6	
ARM31	WALL	5 5 5 5	18	
ARM32	FLOOR	Š	33	
ARM33	FLOOR	Š	37	
ARM34	WALL	5	32	
ARM35	WALL	ĭo	20	
ARM36	WALL	10	102	
ARM38	WALL	10	32	
ARM41	WALL	ĩŏ	18	
ARM42	FLOOR	18	29	
ARM43	FLOOR	-š	32	
ARM45	FLOOR	10	48	
ARM46	FLOOR	- 5	99	
ARM47	WALL	3	36	
ARM48	WALL	14	14	
ARM49	WALL	16	26	
ARM50	WALL	15	14	
ARM51	WALL	12	īi	
ARM52	FLOOR	18	15	
ARM53	WALL	16	57	
ARM55	FLOOR	ī	140	
ARM140	WALL	15	- 8	
AVERAGE	-		40	

NOTES:

- Soil samples were assigned identification numbers such as ARM3, where ARM3 indicates Armco Steel sample number 3. Soil sample numbering is not continuous due to resampling (i.e. ARM40 - 38,200 ppm; excavate and resample: ARM140 - 8 ppm).
- Soil samples were collected from floor or wall surfaces in the excavation.
- Soil samples were collected at depths designated in feet below the ground surface.
- 4. Total Petroleum Hydrocarbons (TPH) in general accordance with EPA Method No. 418.1. Analyses are presented in parts per million (ppm) and the detection limit is 1.0 ppm.

TABLE 2 SAMPLES COLLECTED FROM SOIL FOLLOWING EXCAVATION

NORTH AREA II EXCAVATION (Figure 4)

BAMPLE DESIGNATION ¹	SAMPLE LOCATION ²	DEPTH ³	TPH4
ARM59	FLOOR	2	67
ARM61	WALL	2	21
ARM62	FLOOR	2 2 3 2	33
ARM63	WALL		16
ARM70	FLOOR	20	69
ARM71	WALL	2	43
ARM73	WALL	2	24
ARM75	WALL	8	25
ARM79	WALL	6 .	38
ARM80	FLOOR	31	12
ARM81	WALL	3	52
ARM82	WALL	6 2	19
ARM84	WALL	2	33
ARM85	FLOOR	15	30
ARM87	FLOOR	26	80
ARM90	WALL	26	49
ARM91	WALL	26	22
ARM93	FLOOR	38	25
ARM95	WALL	40	370
ARM97	FLOOR/WALL	32	5
ARM98	FLOOR	39	11
ARM99	WALL	35	23
ARM100	WALL	35	34
ARM101	FLOOR	3	52
ARM102	FLOOR	6	23
ARM103	WALL	15	12
ARM104	FLOOR	18	13
ARM105	WALL	15	17
ARM106	WALL	15	21
ARM110	WALL	8	24
ARM111	WALL	10	242
ARM112	FLOOR	1	42
ARM113	WALL	5	326
ARM114	FLOOR	10	29
ARM170	FLOOR	4	140
AVERAGE			58

NOTES:

- Soil samples were assigned identification numbers such as ARM3, where ARM3 indicates Armco Steel sample Number 3. Soil sample numbering is not continuous due to resampling (i.e. ARM72 - 905 ppm; excavate and resample: ARM170 - 140 ppm).
- 2. Soil samples were collected from floor or wall surfaces in the excavation.
- 3. Soil samples were collected at depths designated in feet below the ground surface.
- 4. Total Petroleum Hydrocarbons (TPH) in general accordance with EPA Method No. 418.1. Analyses are presented in parts per million (ppm) and the detection limit is 1.0 ppm.

TABLE 3

NORTH AREA II BORINGS (FIGURE 4)

Banple Designation ¹	DEPTH ²	TPH ³
ARM25-5-1	25	19
ARM25-8-1	40	17
ARM25-9-1	45	13
ARM26-5-1	25	,23
ARM26-8-1	40	23
ARM26-9-1	45	17
ARM27-5-1	25	ND
ARM27-9-1	45	ND
ARM27-10-1	50	ND
AVERA	AGE	19

NOTE:

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- 1. Soil samples were assigned identification numbers such as ARM25-8-1, where ARM25 indicates Armco Steel boring number 25, and 8-1 indicates the eighth sampling interval, first sample tube.
- 2. Soil samples were collected at depths designated in feet below the ground surface.
- 3. Total Petroleum Hydrocarbons (TPH) in general accordance with EPA Method No. 418.1. Analyses are presented in parts per million (ppm) and the detection limit is 10.0 ppm.

TABLE 4

SAMPLES COLLECTED FROM SOIL FOLLOWING EXCAVATION

SOUTH AREA EXCAVATION (Figure 5)

SAMPLE DESIGNATION ¹	BAMPLE LOCATION ²	DEPTH ³	TPH4
ARM1 ARM2 ARM3 ARM4 ARM5 ARM7 ARM8 ARM11 ARM14A ARM16 ARM17 ARM18 ARM19 ARM19 ARM20 ARM21	FLOOR FLOOR WALL FLOOR WALL FLOOR WALL WALL WALL WALL WALL WALL WALL WAL	3 3 3 4 3.5 3 2 2 2 2.5 1.5	41 7 6 5 8 3 6 14 147 26 10 21 31 14
ARM21A AVERAGE	FLOOR	3.5	25

NOTES:

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- Soil samples were assigned identification numbers such as ARM3, where ARM3 indicates Armco Steel sample Number 3. Soil sample numbering is not continuous due to resampling (i.e. ARM15 - 2,570 ppm; excavate and resample: ARM16 - 26 ppm).
- Soil samples were collected from floor or wall surfaces in the excavation.
- 3. Soil samples were collected at depths designated in feet below the ground surface.
- 4. Total Petroleum Hydrocarbons (TPH) in general accordance with EPA Method No. 418.1. Analyses are presented in parts per million (ppm) and the detection limit is 1.0 ppm.

TABLE 5

SAMPLES COLLECTED FROM SOIL FOLLOWING EXCAVATION

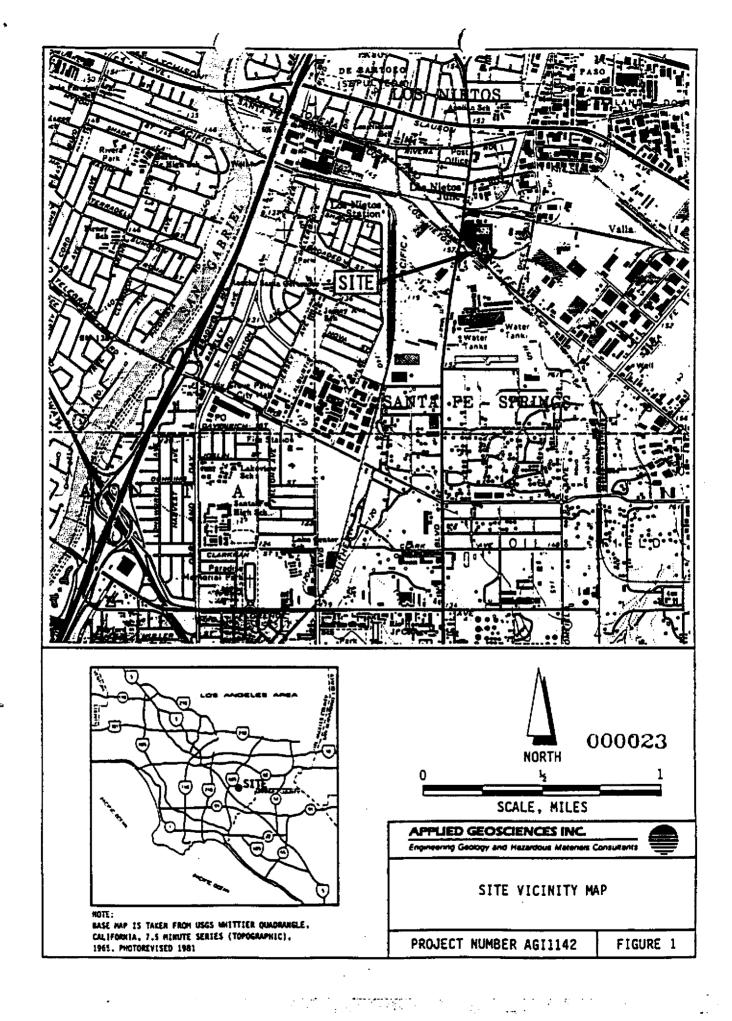
CENTRAL AREA EXCAVATION (FIGURE 6)

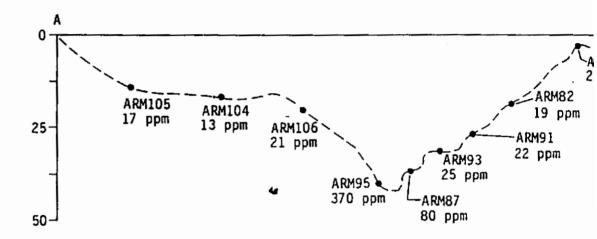
SAMPLE DESIGNATION ¹	SAMPLE LOCATION ²	DEPTH ³	TPH4
ARM144	WALL	35	. 11
ARM146	WALL	35	7
ARM147	WALL	55	8
ARM148	WALL	50	3
ARM150	WALL	55	6
ARM153	WALL	60	7
ARM154	WALL	60	7
ARM155	FLOOR	68	22
ARM156	WALL	60	5
ARM157	WALL	55	14
ARM159	FLOOR	69	17
AVERAGE			10

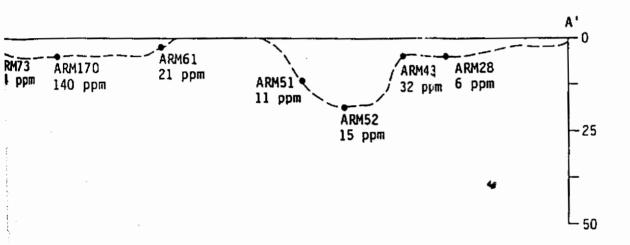
NOTES:

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- Soil samples were assigned identification numbers such as ARM3, where ARM3 indicates Armco Steel sample number 3. Soil sample numbering is not continuous due to resampling (i.e. ARM151 1,220 ppm; excavate area and resample: ARM156 5 ppm)
- 2. Soil samples were collected from floor or wall surfaces in the excavation.
- 3. Soil samples were collected at depths designated in feet below the ground surface.
- 4. Total Petroleum Hydrocarbons (TPH) in general accordance with EPA Method No. 418.1. Analyses are presented in parts per million (ppm) and the detection limit is 1.0 ppm.









APPLIED GEOSCIENCES INC.

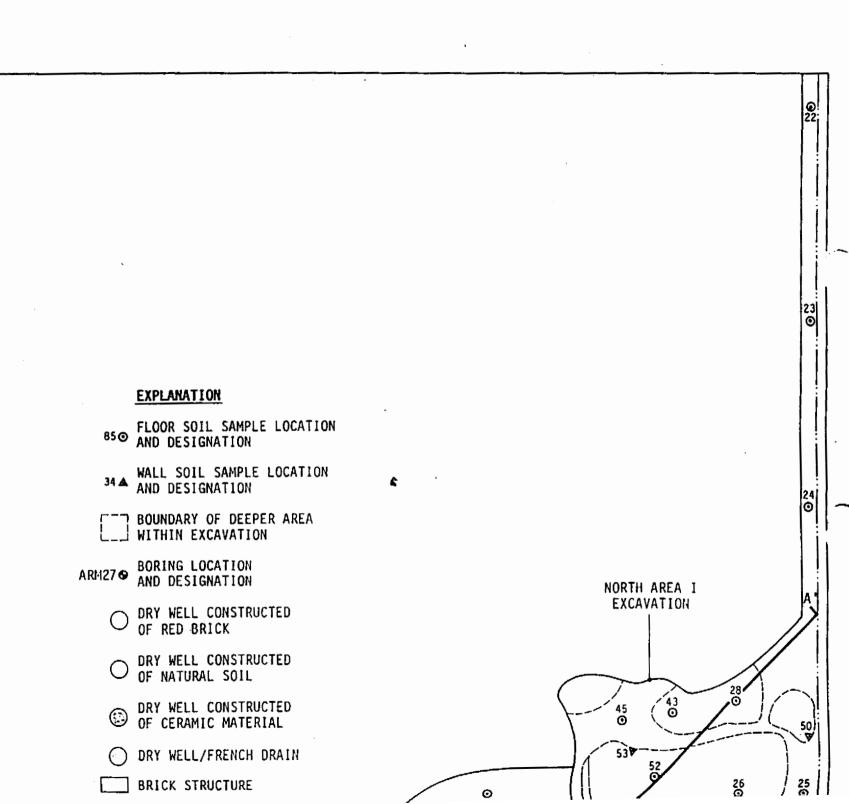
engineering Geology and Hazardous Malerials Consultanti

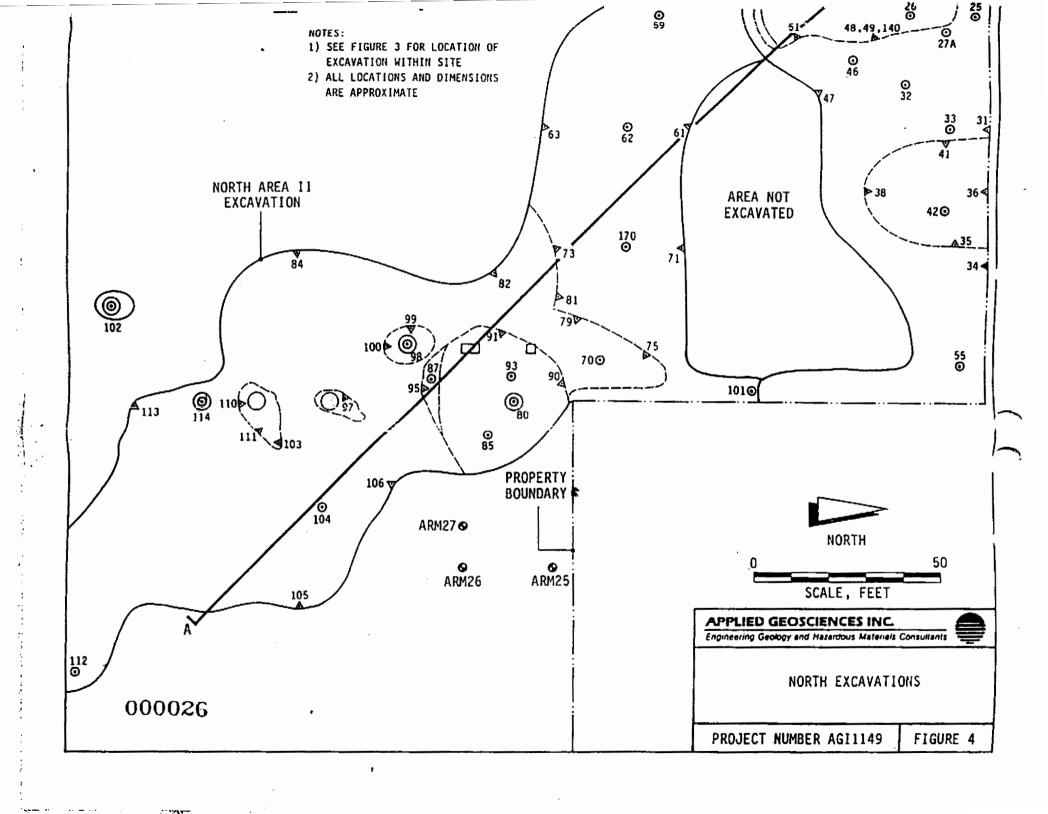


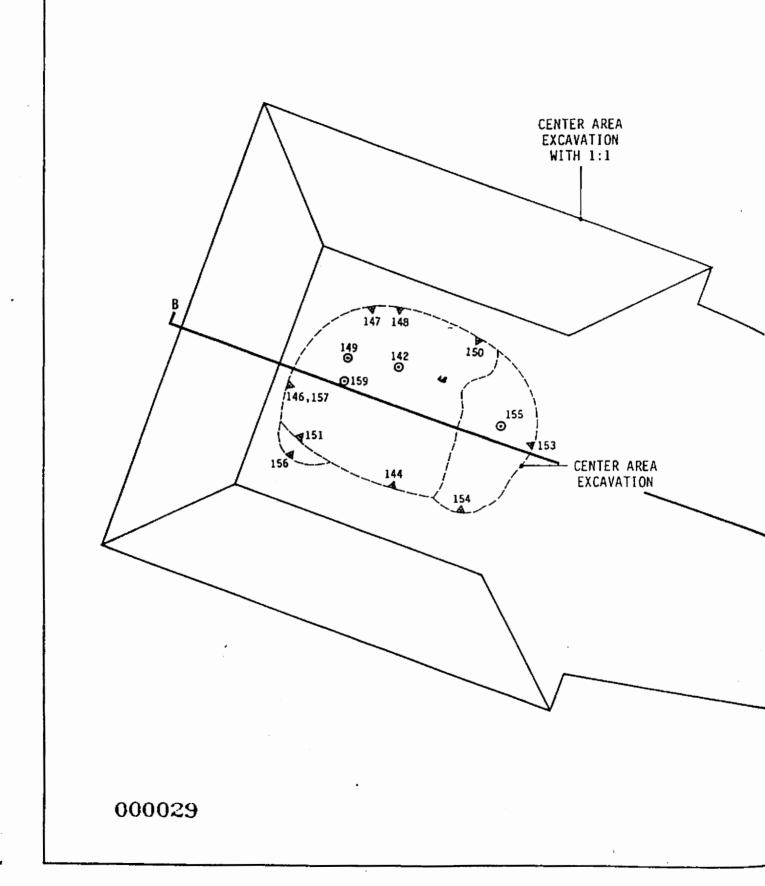
NORTH AREA CROSS SECTION

PROJECT NUMBER AGI1149

FIGURE 4A







EXPLANATION

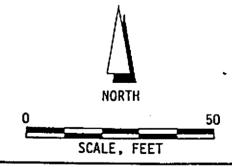
1490 FLOOR SOIL SAMPLE LOCATION AND DESIGNATION

148 AMD DESIGNATION

BOUNDARY OF DEEPER AREA WITHIN EXCAVATION

NOTES:

- 1) SEE FIGURE 3 FOR LOCATION OF EXCAVATION WITHIN SITE
- 2) ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE



APPLIED GEOSCIENCES INC. Engineering Geology and Hazardous Malenais Consultants

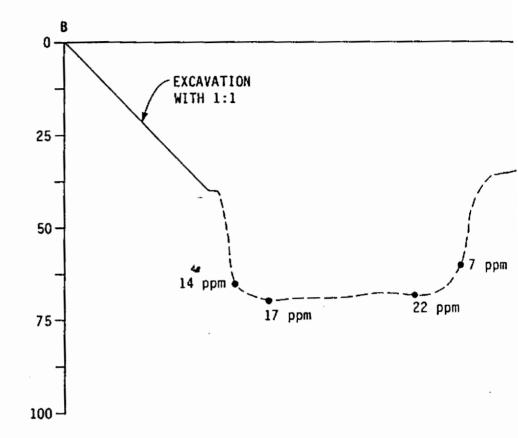
entil dennity and nataroons wateress Consultants

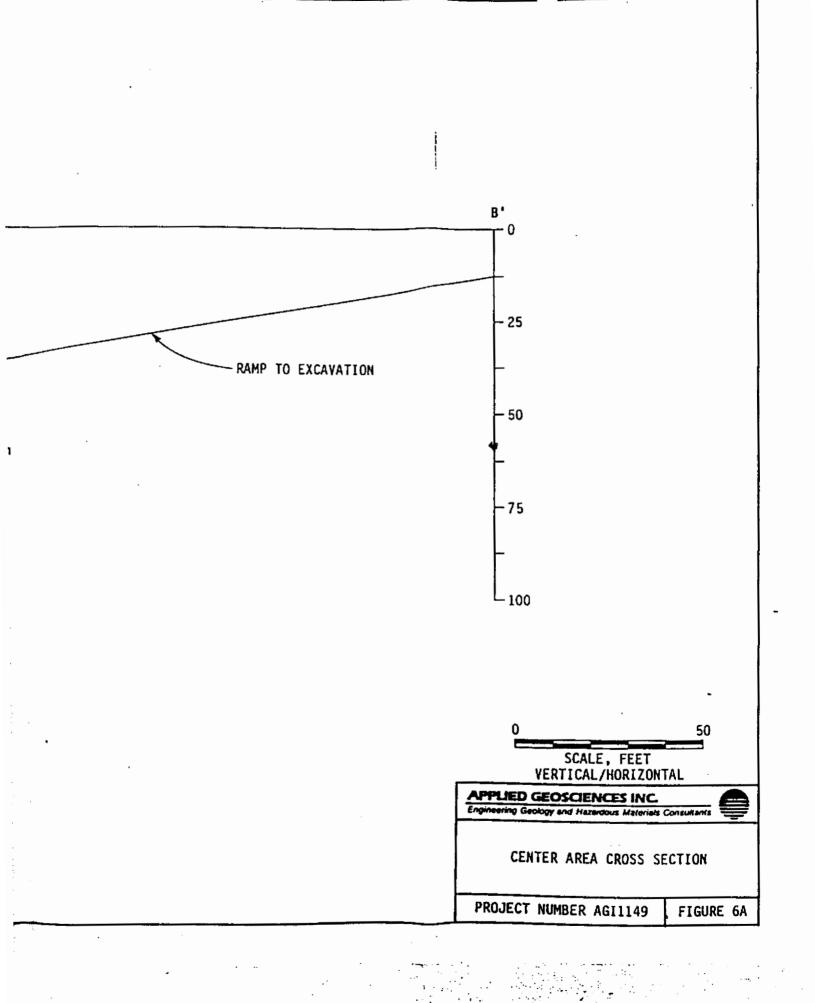


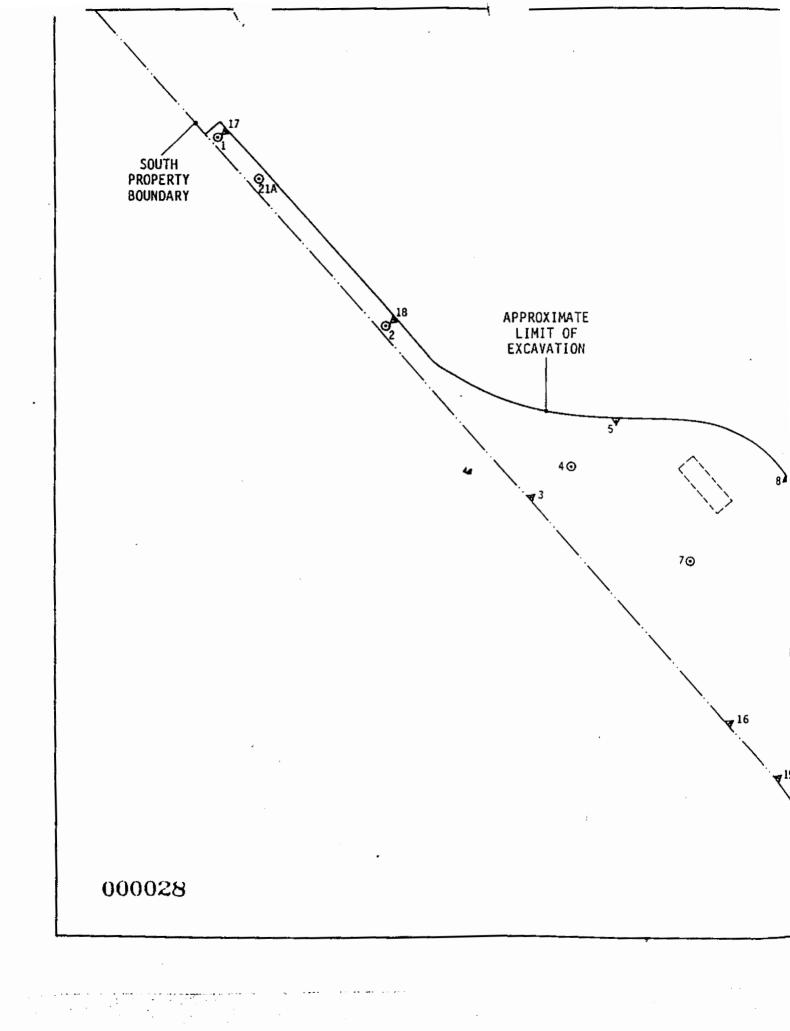
CENTER AREA EXCAVATION

PROJECT NUMBER AGI1149

FIGURE 6





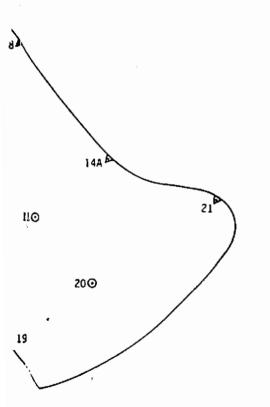


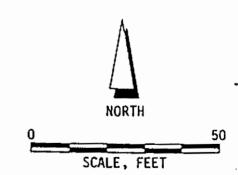
EXPLANATION

- 1⊖ FLOOR SOIL SAMPLE LOCATION AND DESIGNATION
- WALL SOIL SAMPLE LOCATION AND DESIGNATION
- BOUNDARY OF DEEPER AREA WITHIN EXCAVATION

NOTES:

- 1) SEE FIGURE 3 FOR LOCATION OF EXCAVATION WITHIN SITE
- 2) ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE





APPLIED GEOSCIENCES INC. Engineering Geology and Hazardous Materials Consultants					
SOUTH AREA EXCAVATION					

PROJECT NUMBER AGI1149

FIGURE 5

APPENDIX A LABORATORY REPORTS

April 1, 1988

RECEIVED

APR 0 5 1988

APPLIED GEOSCIENCES

WEST COAST SERVICE, INC.

ANALYTICAL CHEMISTS

APPLIED GEOSCIENCES, INC. 17321 Irvine Blvd. Tustin, CA 92680

Attn: Paul Roberts

JOB NO. 9141 "A"

LABORATORY REPORT

Samples Received: One (1) soil sample

Date Received: 3-30-88

Purchase Order No: AGI 1142/Armco

The sample was analyzed as follows:

Samples Analyzed <u>Analysis</u> Results

Volatile Organics **ARM 69** Data Sheets

by EPA 8240

ARM 69 Fuel Hydrocarbons by

modified EPA 8015

(Luft Manual 1987, p.60)

Table I

TABLE I

Parts Per Million

Sample No.	Kerosene	Mineral Spirits	<u>Gasoline</u>	Diesel <u>Fuel</u>	C _{Z0} -C _{30.} *
ARM 69	ND	ND	ND	ND	8000
Detection Limit	10	10	10	10	10

ND-Not Detected

*Heavy hydrocarbon, possibly motor oil

Date Analyzed: 4-1-88

Page 1 of 1

Mary Stordal Analytical Chemist

D.JV Northington. Ph.D. Technical Director

WEST COAST ANALYTICAL SERVICE, INC.

CLIENT: APPLIED GEOSCIENCES

SITE: ARMCO

3

SAMPLE: SAMPLE ARM 69

ANALYSIS TYPE: EPA METHOD 8240 (624)

ORGANICS ANALYSIS DATA RESULTS

GCMS FILENAME: 03/30/88 9141V2 DATE RECEIVED: LOW MATRIX: SOIL LEVEL: DATE PREPARED: 04/01/88 DATE ANALYZED: 04/01/88 VOA543 INSTRUMENT ID: 5101 STANDARD ID:

SAMPLE AMOUNT: 0.5G

"		 	DETECTION
CAS #	COMPOUND	UG/KG(PPB)	LIMIT
67-64-1	ACETONE	 מא	100.
107-02-8	ACROLEIN	ND	100.
107-13-1	ACRYLONITRILE	ND	100.
71-43-2	BENZENE	ND	10.
75-27-4	BROMODICHLOROMETHANE	ИD	10.
75-25-2	BROMOFORM	ND	10.
74-83-9	BROMOMETHANE	ND	50.
78-93-3	2-BUTANONE (MEK)	ND	100.
75-15-0	CARBON DISULFIDE	19.	10.
16-23-5	CARBON TETRACHLORIDE	ИD	10.
108-90-7	CHLOROBENZENE	ND	10.
75-00-3	CHLOROETHANE	ИD	50.
110-75-8	2-CHLOROETHYLVINYL ETHER	ИD	100.
67-66-3	CHLOROFORM	ND	10.
74-87-3	CHLOROMETHANE	ИD	50.
108-41-8	CHLOROTOLUENE	ИD	10.
124-48-1	DIBROMOCHLOROMETHANE	DИ	10.
96-12-8	1,2-DIBROMO-3-CHLOROPROPANE	ИD	50.
95-50-1	1,2-DICHLOROBENZENE	ИD	10.
541-73-1	1,3-DICHLOROBENZENE	ИD	10.
106-46-7	1,4-DICHLOROBENZENE	ИД	10.
75-34-3	1,1-dichloroethane	ИD	10.
107-06-2	1,2-DICHLOROETHANE	ND	10.
75-35-4	1,1-DICHLOROETHYLENE	ИD	10.
156-60-5	TRANS-1,2-DICHLOROETHYLENE	ND	10.
78-87-5	1,2-DICHLOROPROPANE	ND	10.
10061-01-5	CIS-1,3-DICHLOROPROPENE	ND	10.
10061-02-6	TRANS-1,3-DICHLOROPROPENE	ND	10.
123-91-1	1,4-DIOXANE	ND	200.
100-41-4	ETHYLBENZENE	ND	10.
106-93-4	ETHYLENE DIBROMIDE	ND	10.
76-13-1	FREON-TF	ND	10. 50.
119-78-6	2-HEXANONE	ND	100.
75-09-2	METHYLENE CHLORIDE	ND	50.
108-10-1	4-METHYL-2-PENTANONE (MIBK)	ND	
100-42-5	STYRENE	ND	10.
79-34-5	1,1,2,2-TETRACHLOROETHANE	, dr	10. 10.
127-18-4	TETRACHLOROETHYLENE	33.	10.
109-99-9	TETRAHYDROFURAN	ND	
			000033

WEST COAST ANALYTICAL SERVICE, INC.

CLIENT: APPLIED GEOSCIENCES

SITE: ARMCO

SAMPLE: SAMPLE ARM 69

ANALYSIS TYPE: EPA METHOD 8240 (624)

ORGANICS ANALYSIS DATA RESULTS

DATE RECEIVED: 03/30/88 GCMS FILENAME: 9141V2 LOW MATRIX: SOIL LEVEL: DATE PREPARED: 04/01/88 DATE ANALYZED: 04/01/88 STANDARD ID: VOA543 INSTRUMENT ID: 5101

SAMPLE AMOUNT: 0.5G

CAS #	СОМРОИИД	UG/KG(PPB)	DETECTION LIMIT
108-88-3	TOLUENE	 ND	10.
108-88-3			
71-55-6	1,1,1-TRICHLOROETHANE	ND	10.
79-00-5	1,1,2-TRICHLOROETHANE	ND	10.
79-01-6	TRICHLOROETHYLENE	ДИ	10.
75-69-4	TRICHLOROFLUOROMETHANE	ND	10.
108-05-4	VINYL ACETATE	ND	50.
75-01-4	VINYL CHLORIDE	ИD	50.
95-47-6	TOTAL XYLENES	ND	10.

WEST COAST ANALYTICAL SERVICE, INC.

CLIENT: APPLIED GEOSCIENCES

SITE: ARMCO

SAMPLE: SAMPLE ARM 69

TENTATIVELY IDENTIFIED COMPOUNDS

COMPOUND NAME

FRACTION CONCENTRATION
UG/KG(PPB)

1 C7-C11 ALIPHATIC AND ALICYCLIC
HYDROCARBONS
VOA
2 C9-C10 ALKYLBENZENES
VOA
500.

Data Reporting Qualifiers

- Value If the result is a value greater than or equal to the Detection Limit (DL), the value is reported.
- ND Indicates that the compound was analyzed for but not detected. The minimum DL for the sample with the ND is reported based on necessary concentration or dilution actions.
- TR Indicates an estimated value. This flag is used when the mass spectral data indicates the presence of a compound that meets the identification criteria but the result is less than the specified DL but greater than zero.



MOBILE DIVISION

11631 Seabcard Crose • Sterion CA 90590 (714) 891-0405 • FAX (714) 893-6709 • [900] LAB-1CRL

LABORATORY REPORT

Page 1 of 3

TO: Aman Brothers P. O. Box 4233 Covina, CA 91723 ATTN: Mr. Don Vossler ANALYSIS NO.: DATE SAMPLED: DATE REC'D: BATCH: MATRIX: NØ40588-1/22 4/5/88 4/5/88 N-311 Soil

PROJECT:

Project No. AGI1142, Armoo Steel, Los Nietos/Norwalk, Santa Fe Springs

Results (mq/kq)

Sample Identification	Total Recoverable Hydrocarbons (EPA418.1)
Arm 102	23.
Arm 103	12.
Arm 104	13,
Arm 105	17.
Arm 106	21.
Arm 107	4140.
Arm 108	212.
Arm 103	£14.
Arm 110	24.
Arm 111	242.
Arm 112	42.
Arm 113	326.

Note: Samples were received intact and with the chain of custody.

000037

Reviewed and approved

U-G-CS Date



MOBILE DIVISION

LABORATORY REPORT

Page 2 of 3

TOI Aman Brothers F. O. Box 4233 Covina, CA 91723 ATTN: Mr. Don Vossler

ANALYSIS NO. t DATE SAMPLED: DATE REC'D: **BATCH:** MATRIX:

NØ4058B-1/22 4/5/88 4/5/88

N-311

Soil

PROJECT:

Project No. AGII142, Armoo Steel, Los Nietos/Norwalk, Santa Fe Springs

Results (mq/kq)

Sample Identification	Total Recoverable Hydrocarbons <u>(EPA418.1)</u>
Arm 114	29.
Arm 115	140.
Arm 116	24.
Arm 117	44.
Arm 118	302.
Arm 119	237.
Arm 120	19.
Arm 121	17500.
Arm 122	25.
Arm 123	46.

Note: Samples were received intact and with the chain of custody.

000038

Reviewed and approved

Date



MOBILE DIVISION

11631 Skaboard Circle + Starter CA 90660 (714) 891-8405 + FAX: (714) 893-8709 + (800) LA8-1CPL

LABORATORY REPORT

Page 3 of 3

TO: Aman Brothers F. O. Box 4233 Covina, CA 91723 ATTN: Mr. Don Vossler ANALYSIS NO.: DATE SAMPLED: DATE REC'D: BATCH: NØ4Ø588-1/22 4/5/88 4/5/88 N-311

MATRIX:

Soil

PROJECT:

Project No. AGI1142, Armoo Steel, Los Nietos/Norwalk, Santa Fe Springs

Quality Control Data

Total Recoverable Hydrocarbons (EPA418.1)

Matrix spike RPD 94.5%

Note: Samples were received intact and with the chain of custody.

000039

Reviewed and approved

4-6-84

APPLIED GE SCIENCES INC. SHIPMENT NO .:_ CHAIN OF CUSTODY RECORD PAGE_LOF_7 DATE 4 151 PROJECT NAME: ACTACO A611142 PROJECT NO .:_ Type of Sample Type of Preservation Sample Number Location Type of Container Analysis Required * Material Method Chemical Temp ARMIOZ 50:1 Grah Glass 34. TUE 418.1 12 M 103 ARM 101 ARMIOS A & M 106 48M 107 ARM_10.8 ARM 109 ARMILO ARMIII **ል**ዪM ነነ2 ARM 113 APM 114 A R M 116 みんかいけ A R M 118 ARM 119 ARM 120 Total Number of Samples Shipped: 22 Samoler's Signature: Relinquished By Signature Received By: Date Signature__ 4518 Printed Name Paul Roberts Printed Name__S. O'NEIT Sample Company A101: ex Geosciences Too Company CRI LABS. Relinquished By: Received By: Date Signature_ Signature_ Printed Name Printed Name... Time Company_ Company... Reason. Relinquished By: Received By: Dete Signature Signature_ Printed Name__ Printed Name__ Time Company___ Company___ Reason___ Relinquished By: Received By: Date Signature_ Signature_ Printed Name_ Printed Name_ Time Company__ Company___ Reason ___ Special Shipment / Handling / Storage Requirements: 000040 * Note - This does not constitute authorization to proceed with analysis

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APPLIED

SCIENCES INC.

SHI	PME	NT	NO.	:_



CHAIN OF CUSTODY RECORD

PAGE 2 OF 2 DATE 4 15188

PROJECT NAME: ACMCO

PROJECT NO .: AGT 1142

Comple Marches	Location	Type of	Sample	Type of Container	Type	of Preservation	Agalus	is Required*			
Sample Number	Cocation	Material	Method	Type of Container	Temp	Chemical		is neguired			
ARM 122		Soil	Gest	61255	34.	ILE	4	18.1			
ARM123		4	V	7	1	¥	_	1			
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Total Number of	Sentipoles Shi	pped: 2	2 Sampler	's Signature:	ul 1	KON HU	<u>/</u>				
Relinquished By:			4	Received By:	W :	_		Date 4/5/88			
Signature Printed Name P		01/7//S	<i>J</i>	Signature XV. / Z	Printed Name 5.000 EIL						
Company A 20\i	04 (400	4-19	LTAC.	CompanyCA				Time			
Reason To	2 b.	C C C C						15 Same/sa			
Relinquished By:				Received By:	Received Rus						
Signature				Signature				Date / /			
Printed Name				_ Printed Name				Time			
Company				_ Company				Hima			
Reason											
Relinquished By:				Received By:				Date			
Signature				Signature							
Printed Name			····	Printed Name				Time			
Company Reason				Company							
Relinquished By:				Received By:				Date			
Signatura				Signature	1 1						
Printed Name				Printed Name	Time						
Company				Company				i ime			
Reason											

Special Shipment / Handling / Storage Requirements:

3

000041

* Note - This does not constitute authorization to proceed with analysis



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Chemical Research Laboratories, Inc.

MOBILE DIVISION

11631 Seaboard Circle • Starter C4 90660 (714) 891-0405 • FAX (714) 893-6709 • 1600) LAS-1CR_

LABORATORY REPORT

Page 1 of 2

TO: Aman Brothers P. O. Box 4233 Covina, CA 91723 ATTN: Mr. Don Vossler ANALYSIS NO.: DATE SAMPLED: DATE REC'D: BATCH: MATRIX: NØ40488-1/15 4/4/88 4/4/88 N-309 Soil

PROJECT:

Project No. AGI1142, Armoo Steel, Los Nietos/Norwalk, Santa Fe Springs

Results (mg/kg)

Sample Identification Arm-24-1-1	Total Recoverable Hydrocarbons (EPA418.1) 7.
Arm-24-2-1	23.
Arm-24-3-1	16.
Arm 90	49.
Arm 91	22.
Arm 92	34600.
Arm 93	25.
Arm 94	17200.
Arm 95	370.
Arm 96	78.
Arm 97	5.
Arm 98	11.
Arm 99	23.
Arm 100	34.
Arm 101	52.

Note: Samples were received intact and with the chain of custody.

1-6-04 000042



Chemical Research Laboratories, Inc. MOBILE DIVISION

11831 Seaticard Circle + Stantor CA 90680 (714) 891 0405 + FAX. (714) 893-6709 + (800) L48-10PL

LABORATORY REPORT

Page 2 of 2

N040488 -1/15

TO:

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Aman Brothers P. O. Box 4233

Covina, CA 91723 ATTN: Mr. Don Vossler ANALYSIS NO. 1 DATE SAMPLED: DATE REC'D: BATCH:

4/4/88 4/4/88 N-309

MATRIX: Soil

PROJECT:

Project No. ABI1142, Armoo Steel, Los Nietos/Norwalk, Santa Fe Springs .

Quality Control Data

Total Recoverable Hydrocarbons (EPA418,1)

Matrix spike RFD.

84.E% 15.3%

Note: Samples were received intact and with the chain of custody.

Reviewed and approved

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	614 E. Edna PI										TYPE		,		AN	ALY:	S1S			THEF
AMAN E				a	P.O.Box 4233 Covins, CA 91723 (818) 967-4287 (818) 967-4288 FAX (818) 915-3244							TUBE	15	HC 418,1		ORGANICS		25/827	TOTAL WET	
PROJECT NO		PRO	JECT N	IAME			SAMPLEDS:	(Signature)	7	1			00		·	ō		장	21	1
A6I114	12	A	r	o, SFS			fau	CKOCK	ST.	يو	<u>1</u>	38/8	皇	370	8020	171LE 8240		劉	CAM METALS	1
SAMPLE NUMBER	DATE	TME			SAN	MPLE DES	CFIPTION/R	EMARKS		GLASS	PLASTIC	BRASS/SS	FUEL HG	PETROLEUM	BTX 8020	VOLATILE 624/8240	LEAD	S S	3	\perp
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ARM24-3-1		5.20										X		X						
ARM90		مة:4								X				×						
ARMAI	1	9:52								Х				X						
ARM92		9:59						,		X				X	_					
ARM93	4/4	नःऽ8								X				X			\perp			\perp
ARM 99	1/1	11:20		,, 						X				X						
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ARM96	4/4	{:6 }		<u> </u>	~~~	*************	************			X				X				\perp		
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ARM99	4/4	3:49							X				X							
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MOBILE DIVISION

11631 Seaboard Circle + Starton (74 9068) (714) 691-0405 + FAX (714) 693-6107 + 1600: LAB-1030

LABORATORY REPORT

Page 1 of 2

TO: Aman Brothers P. O. Box 4233 Covina, CA 91723 ATTN: Mr. Don Vossler PROJECT: ANALYSIS NO.: DATE SAMPLED: DATE REC'D: NØ40188-1/13 4/1/88

DATE REC'D: 4/
BATCH: N-

4/1/88 N-307

MATRIX: Soil

Project No. AGI1142, Armoo Steel, Los Nietos/Norwalk, Santa Fe Springs

Results (mg/kg)

Sample Identification	Total Recoverable Hydrocarbons <u>(EPA418.1)</u>
Arm 81	52,
Arm 82	19.
Arm 83	25100.
Arm 23-2-1 @ 43'	39.
Arm 84	33.
Arm 23-3-1 9 50'	11900.
Arm 85	30.
Arm 23-4-1 @ 53'	384.
Arm 86	2120.
Arm 87	80.
Arm 88	855.
Arm 89	1350.

Note: Samples were received intact and with the chain of custody.

CB With Be Reviewed and approved

4-6-68 Date



MOBILE DIVISION

11631 Seablard Certle • Starton CA 2060 (7141891-0405 • FAX (7141893-6709 • BXC:LAB-10RL

LABORATORY REPORT

Page 2 of 2

TO: Aman Brothers

P. O. Box 4233 Covina, CA 91723 ATTN: Mr. Don Vosslær ANALYSIS NO.: DATE SAMPLED: NØ40188-1/13 4/1/88

DATE SAMPLED DATE REC'D:

4/1/88

BATCH: MATRIX: N-307 Soil

PROJECTI

Project No. AGI1142, Armoo Steel, Los Nietos/Norwalk, Santa Fe Springs

Quality Control Data

Total Recoverable Hydrocarbons (EPA418.1)

Matrix spike 105% Matrix spike duplicate 104% RPD 1%

Note: Samples were received intact and with the chain of custody.

co Wilter Bernard approved

4-12-St

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This report persons only to the samples investigated and does not indecessably apply to give apparation (detricts) or similar materials. This report is submitted for the enclusive use of the chemic whom it is appreciated on of this report of use of this Laboratory's name for advertising or publicity purposes in thout authorization is prohibited.

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(818) 967-4287 AMAN BROTHERS (818) 967-4288					=		ŭ		5/8270	TOTAL	-	١
ENVIRONMENTAL ENGINEERING FAX (818) 915-3244			TUBE	2	윤		ORGANIC		15 82 82 82	S 10		}
AGI 1/42 PROJECT NAME ARMCO SAMPI (RECESSIONALUTE)	SS	ASTIC	BRASS/SS	HC 80	PETROLEUM	8020	ATILE		RACTAB	WETAL		
SAMPLE DATE TIME SAMPLE DESCRIPTION/REMARKS	GLASS	7	BRA	FJEL.	PET	BTX	VOL	LEAD	EX TO	CAM	1	
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MM23-2-1 0945 43'			x		X							
84 090 84 p ~/2.5 20° below sur / 33	Y		Ĺ		X	1						
APH23-3-1 1015 50'			X		X	4						1
BS 1030 85 @ - 15. 11. supt 20 ppm	×				1							
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	PROJE	CT NAME:		ARM		DATE	411188
	PROJE	CT NO.:	AL	11142			
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* Note - This does not constitute authorization to proceed with analysis

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LABORATORY REPORT

Page 1 of 1

D033188-1/11

TO:
Aman Brothers
P. O. Box 4233
Covina, CA 91723
ATTN: Mr. Don Vossler
DOO ICCT.

ANALYSIS NO.: DATE SAMPLED: DATE REC'D: BATCH:

3/31/88 2/31/88 D-169

MATRIX: Soil

Project No. P83RMB1, Armco Steel, Los Nietos/Norwalk, Santa Fe Springs

Results (mg/kg)

Sample Identification	Total Recoverable Hydrocarbons (EPA418.1)
Arm-78	22000.
Arm-20-1-1	13900.
Arm-20-2-1	12900.
Arm 79	38.
Arm-21-2-1	8.
Arm-21-3-1	14.
Arm-80	12.
Arm-22-2-1	16.
Arm-22-3-1	15.
Quality Control	Total Recoverable Hydrocarbons (EPA418.1)
Matrix spike recovery RPD	101% 0.3%

Note: Samples were received intact and with the chain of custody.

Reviewed and Approved

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	614 E. Edna PI P.O.Box 4233										TYPE					AN	NALYSIS				OTHER		
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LABORATORY REPORT

TO

Aman Brothers P. O. Box 4233 Covina, CA 91723 ATTN: Mr. Don Vossler ANALYSIS NO.: DATE SAMPLED: D033088-1/10 3/30/88

DATE REC'D: BATCH:

2/30/88 D-168

MATRIX:

Soil

PROJECT:

Project No. P83RMB1, Armoo Steel, Los Nietos/Norwalk, Santa Fe Springs

Results (mg/kg)

Sample Identification	Total Recoverable Hydrocarbons (EPA418.1)
Arm 19-1-1	25.
Arm 19-2-1	28.
Arm 68	45800.
Arm E9A	46900.
Arm 70	69.
Arm 71	43.
Arm 72	905.
Arm 73	24.
Arm 74	2750.
Arm 75	25.

Total Recoverable Hydrocarbons Quality Control Data (EPA418.1)

Matrix spike EPD

97.% 3.3%

Note: Samples were received intact and with the chain of custody.

Reviewed and approved

Date

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	•	TYPE					ANALYSIS		SIS			OTHER	
AMAN BROTHERS ENVIRONMENTAL ENGINEERING					TUBE	\$	HC (418.)		ORGANICS		E 25/8270	TOTAL WET	
PROJECT NO. PROJECT N	51.	66.43	S.	PLASTIC	BRASS/SS TI	L HC 801	PETROLEUM	8TX.8020	VOLATILE OF 624/8240	٥	EXTRACTABLE ORGANICS 625/8270	METALS	
SAMPLE NUMBER DATE TIME -	SAMPLE DESCRIPTION/RE	EMARKS 2	GLASS	PLA	9A,	FUEL	PET	B TX	VOI 624	LEAD	EX OP(CAM	
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Chemical Research Laboratories, Inc.

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LABORATORY REPORT

Page 1 of 2

TOI Aman Brothers P. O. Box 4233 Covina, CA 91723 ATTN: Mr. Don Vossier PROJECT:

ANALYSIS NO.: DATE SAMPLED: DATE REC'D: BATCH:

DØ32888-1/17 3/28/88 3/28/88 D-166

Soi 1

MATRIX:

Project No. FB3RMB1, Armoo Steel, Los Nietos/Norwalk, Santa Fe Springs .

Results (mg/kg)

Sample <u>Identification</u>	Total Recoverable Hydrocarbons (EPA418.1)
Arm - 31	18.
Arm - 32	33.
Arm - 33	37.
Arm - 34	32.
Arm - 35	20.
Arm - 36	102.
Arm - 37	3190.
Arm - 38	32.
Arm - 39	8690.

Note: Samples were received intact and with the chain of custody.

3-29-88



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LABORATORY REPORT

Page 2 of 2

TO: Aman Brothers P. O. Box 4233 Covina, CA 91723 ATTN: Mr. Don Vossler PROJECT: ANALYSIS NO.: DATE SAMPLED: DATE REC'D: BATCH: MATRIX: D032888-1/17 3/28/88 3/28/88 D-166 Soil

Project No. PB3RMB1, Armoo Steel, Los Nietos/Norwalk, Santa Fe Springs

Results (ma/kg)

Sample <u>Identification</u>	Total Recoverable Hydrocarbons <u>(EPA418.1)</u>
Arm - 40	38200.
Arm - 41	18.
Arm - 42	29.
Arm - 43	32.
Arm - 44	326.
Arm - 45	48.
Arm - 48	99.
Arm - 47	36.

Note: Samples were received intact and with the chain of custody.

60 Wilth Renamed Reviewed and approved

3- 29 - 88 Date 00002

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AMAN	ENTAI	ENGI	HEERIN		P.O.Box 4233 Covina, CA 9173 (B18) 967-4287 (818) 967-4286 FAX (818) 915-3				UBE	15	HC 418.1		ORGANICS		ILE 625/8270	S TOTAL WET			
PROJECT NO			JECT N	_		SAMPLERS:	(Signature) Paul Pose to Applix			BRASSISS TUBE	FUEL HG 8015	PETROLEUM HC	2	비약 이		EXTRACTABLE ORGANICS 625	TALS		
183RN	<u> </u>		hmio	Shel	525	R.66	titte Bore	GLASS	PLASTIC	ASS/	٦ ٢	P. P. C.	BIX.8020	VOLATRE 624/8240	ş	CAN	M MET		
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614 E. Edna PI P.O.Box 4233										TYPE ANALYSIS								ОТ		
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MOBILE DIVISION

11631 Seaboard Orda + Starton, CA 90580 (714) 891-0405 + FAX: (7141893-6709 + (600) LAS-1CRL

LABORATORY REPORT

Page 1 of 2

TO: Aman Brothers F. O. Box 4233 Covina, CA 91723 ATTN: Mr. Don Vossler ANALYSIS NO.: DATE SAMPLED: DATE REC'D: BATCH: MATRIX: D032988-1/16 3/29/88 3/29/88 D-167 Soil

PROJECT:

Project No. FBGRMB1, Armoo Steel, Los Nietos/Norwalk, Santa Fe Springs

Results (mq/kq)

Sample Identification	Total Recoverable Hydrocarbons (EPA418.1)
Arm 48	14.
Arm 49	26.
Arm 50	14.
Arm 51	11.
Arm 52	15.
Arm 53	57.
Arm 54	577.
Arm 55	140.

000058

Note: Samples were received intact and with the chain of custody.

Willte Reviewed and Approved

3-30-84 Bata

This report pensins only to the samples investigated and does not necessarily apply to other experience deficies or similar materials. This report is submitted for the exclusive use of the client to whom it is addressed. Any reproduction of this report or use of this Laboratory's name for edvertising or publicity purposes without authorization is promised.



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LABORATORY REPORT

Page 2 of 2

TO: Aman Brothers F. O. Box 4233 Covina, CA 91723 ATTN: Mr. Don Vossler ANALYSIS NO.: DATE SAMPLED: DATE REC'D: BATCH: MATRIX: D032988-1/16 3/29/88 3/29/88 D-167 Soil

PROJECT

4

Project No. P83RMB1, Armoo Steel, Los Nietos/Norwalk, Santa Fe Springs

Results (mg/kg)

Sample Identification	Total Recoverable Hydrocarbons (EPA418.1)
Arm 56	2630.
Arm 57	83400.
Arm 58	384.
Arm 59	67.
Arm 60	346.
Arm 61	21.
Arm E2	33.
Arm 63	16.

Quality Control

Matrix spike recovery

86%

000059

Note: Samples were received intact and with the chain of custody.

Reviewed and approved

3-30-18

This report pertains any to the samples investigated and does not necessarily apply to other apparently identical or similar materials. This report is submitted for the exclusive use of the cases to whom it is addressed. Any reproduction of this report or use of this caponalogy's name for adventising or publicity purposes without authorisation is prohibated

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PROJECT NO			JECT A		΄ Λ	i // .	(Signature)]_	۱		90	PETROLEUM	20	2	į	10.5 S	TALS	
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SAMPLE	DATE		rm.	o Stee	SAMPLE DESCRI	EPTION/RE	KAYUT (AGE)	GLASS	PLASTIC	BRASS/SS	FUEL HC	PETROLEUM	8TX.8020	VOLATILE 624/8240	LEAD	ORGAN		
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MOBILE DIVISION

11631 Seaboard Circle + Stanton CA 90680 (714) 691-0405 + FAX (714) 693-6709 + (600) LAB-10PL

LABORATORY REPORT

TO Aman Brothers P. O. Box 4233 Covina, CA 91723 ATTN: Mr. Don Vossler ANALYSIS NO.: DATE SAMPLED:

N032588-1/6 3/25/88

DATE REC'D: BATCH:

3/25/88 N-2921

MATRIX:

Soil

÷

Project No. P83RMB1, Armco Steel, Los Nietos/Norwalk, Santa Fe Springs

Fesults (mo/Lo)

Sample Identification	Total Recoverabl Hydrocarbons <u>(EPA418.1)</u>
Arm - 14 - A	147.
Arm - 25	81.
Arm - 26	•ND(1.)
Arm - 27	8780.
Arm - 28	٤.
Arm - 27A	5,

000062

*ND - not detected at the detection limit expressed within the parentheses.

Note: Samples were received intact and with the chain of custody.

Reviewed and approved

3-21-88

This report parts his day to the samples investigated and does not necessarily apply to other apparently identical or similar materials. This report is submitted for the exclusive use of the Clerk to whom it is addressed. Any reproduction of this report or use of the Laboratory's name for adventising or publicity purposes without suffortision is prohibited.

614 E. Edna Pl						TYPE			ANALYSIS							OTHER				
	ENTAL	ENGI	S NEERIN		Covina (818) (818)	ox 4233 a, CA 91723 967-4287 967-4288 (818) 915-32	44					TUBE	15	HC 418.1		VOLATILE ORGANICS		ILE 625/8270	TOTAL WET.	
PROJECT NO			ARM	IAME	s ÷ s		SAMPLERS:	Signature) A Ussale		SS	37.5	S	FUEL HC 8015	PETROLEUM HC	9020	ATILE OF		ANICS	METALS	
SAMPLE NUMBER	DATE	TIME	<u>.</u>		5	SAMPLE DES	CRIPTION/RE	MARKS		GLASS	PLASTIC	8AA	125	PET	E X	VOL 624/	LEA	EXT OBG	240	
ARM14A	3/25	8110	50,	1								L	L	X						- J.— -
ARM25	3/25	9:00	-	<u> </u>										X						
ARM 26	1/25	1:00	-							_				X						
ARM27	3/2,	11:00 A.A.		<u> </u>	· .					L				X						
Ac~28	1/2+	11:40	-		· 					L				X						
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MOBILE DIVISION

LABORATORY REPORT

TO

Aman Brothers P. O. Box 4233

Covina, CA 91723 ATTN: Mr. Don Vossler

PROJECT:

Project No. P82RMB1, Armco Steel, Los Nietos, Norwalk

ANALYSIS NO .: DATE SAMPLED:

DATE REC'D:

BATCH: **MATRIX**: N032488-1/25

3/24/88 3/24/88

N-289

Soil

Results (mq/kg)

Sample Identification	Total Recoverat Hydrocarbons (EPA418.1)	
Arm - 1	41.	
Arm - 2	7,	
Arm - 3	٤.	
Arm - 4	5.	
Arm - 5	8.	
Arm - E	487.	
Arm - 7	з.	
Arm - 8	٤.	
Arm - 9	1730.	
Arm - 10	2080.	
Arm - 11	14.	•
Arm - 12	4970.	000064

Note: Samples were received intact and with the chain of custody.

Reviewed and approved

3-24-15

This report pensing only to the samples intrestigated and goes not necessarily apply to other apparently identical or similar materials. This report is submitted for the exclusive use of the cliently whomic is addressed. Any reproduction of this report or use of this Laboratory's name for advertising or publicity purposes without eutronization is prohibited.



MOBILE DIVISION

11631 Seaboard Circle • Stanton CA 90680 {7:4)891-0405 • FAX: (7:4)893-6709 • (600) LAB-10RL

LABORATORY REPORT

TO:

Aman Brothers F. O. Box 4233 Covina, CA 91723 ATTN: Mr. Don Vossler ANALYSIS NO.: DATE SAMPLED:

NØ32488-1/25

DATE REC'D: BATCH:

3/24/88 3/24/88

MATRIX:

N-283

Soil

PROJECT:

Project No. P83RMB1, Armco Steel, Los Nietos, Norwalk

Results (mq/lq)

Sample Identification	Total Recoverable Hydrocarbons (EPA418.1)	
Arm - 13	538.	•
Arm - 14	5770.	
Arm - 15	2570.	
Arm - 16	26.	
Arm - 17	10.	
Arm - 18	21.	
Arm - 19	31.	
Arm - 20	14.	
Arm - 21	47.	
Arm - 21-A	8.	
Arm - 22	50.	
Arm - 23	88.	
Arm - 24	#ND(1.)	000065

*ND - not detected at the detection limit ()

Note: Samples were received intact and with the chain of custody.

Reviewed and approved

This report persons only to the samples were supplied and does not necessarily apply to other apparently identical or senser materials. This report is submitted for the explusive use of the chemics which it is addressed. Any reproduction of this report or use of this Laboratory's name for advertising or publicity purposes without sufferigation is profibiled.

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PROJECT NO		1 /	MEGI N	Strel,	SFS	SA	MPLERS:	(Signature)	P.	PLASTIC .	BRASS/SS TO	유 양	PETROLEUM	BTX.8020	VOLATILE OF 624/8240		ANICS	METALS		
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614 E. Edna Pl					TYPE			ANALYSIS												
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G14 E. Edna Pt							ANALYSIS							
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PROJECT NO. PROJECT NAME PROJECT NAME Armin C	Steel SES Kil	Le Stiller	SS	STIC	BAASS/SS TUB	ñ	PETROLEUM		VOLATILE 0 624/8240		ANICS	METALS		
SAMPLE NUMBER DATE TIME	SAMPLE DESCRIPTION/	REMARKS	GLASS	PLASTIC	BAA	FUEL	PET	BTX	VOL 624/	LEAD	EXT ORG	NY CYM		
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MOBILE DIVISION

:1631 Seatoerd Circle ● Starton CA 90650 (7:4) 891-0405 ● FAX (7:14) 893-8709 ● (800) LAB-1CRL

Aman Brothers P. O. Box 4233 Covina, CA 91723 ATTN: Mr. Don Vossler ANALYSIS NO.:

AØ4Ø688-1/14

BATCH: DATE REC'D: A-001

ANALYSES:

418.1

PROJECT:

Enclosed with this letter is the report on the chemical and physical analyses on the samples from ANALYSIS NO: A040688-1/14.

The samples were received by CPL in a chilled state, intact, and with the chain-of-custody record attached.

%R+

Please note that $ND(\cdot)$ means not detected at the detection limit expressed within the parentheses.

Stated below are the pertinent quality control data.

Matrix: Soil

Method	Analyte	Matrix spike		PPD2	
418.1	recoverable oil	93.	pass	€.6	pass

1 %R - per cent recovery

RPD - relative per cent difference between MS and MSD recoveries.

Watte Reige

4-7-88

000069



TO:

Chemical Research Laboratories, Inc.

MOBILE DIVISION

11631 Sesboard Circle • Santon CA 90680 (714) 891-0405 • FAX. (714) 893-6709 • (900) LAB-1CRL

LABORATORY REPORT

ANALYSIS NO.: A040688-1/14 DATE SAMPLED:

4/6/88 4/6/88

DATE REC'D: BATCH:

A-001

Covina, CA 91723 ATTN: Mr. Don Vossler MATRIX:

Soi l

Total Recoverable

PROJECT:

Aman Brothers

P. D. Box 4233

Project No. AGI1142, Armoo Steel, Los Nietos/Norwalk, Santa Fe Springs

Results (mg/kg)

Sample Identification	Hydrocarbons (EPA418.1)
Arm SP1	4350.
Arm SP2	2640.
Arm SP3	1260.
Arm SF4	3170.
Arm SP5	1880.
Arm 124	547.
Arm 125	23.
Arm 126	29.
Arm 127	31400.
Arm 128	*ND(1.)
Arm 129	13600.
Arm 130	99.
Arm 131	14.
Arm 132	47.

000070

CHAIN OF CUSTODY RECORD PAGE___ PROJECT NAME: ACMCO PROJECT NO .: AGTILAZ Type of Sample Type of Preservation Sample Number Location Type of Container Analysis Required * Material Method Temp Chemical 418.1 . Sail Good 226/9 34. Tce. IASMI AKMSPZ EMSP2 R MSP4 ARMSPS 1RM 124 4RM 125 12M 126 ARMIZZ ARM 128 4RM 129 ARM 130 ARMIZI <u>9RM132</u> otal Number of Simoles Shipbes: 14, Sampler's Signature: Received By: Relinquished Bur Date Signature _ au Signature____ 416 188 Printed Name Paux Roberts Printed Name S. O'NEIL Company Applied Georgiences Time Same/e Company CHEMICAL RESEARCH LABS. TWC Resson To 1 2 to (CRL Received By: elinquished By: Date Signature_ Signature_ Printed Name... Printed Name_ Time Company_ Company___ Resson__ Relinguished By: Received By: Date Signature_ Signature_ Printed Name_ Printed Name_ Time Company___ Company_ Reason Received By: elinguished By: Date Signature_ Signature_ Printed Name. Printed Name, Time Company_ Company_ Reason_ Special Shipment / Handling / Storage Requirements: 000071 * Note - This does not constitute authorization to proceed with analysis

SHIPMENT NO .: 6

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	PROJE	CT NO.:	AGI 1	142				
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* Note - This do	es not cons	titute suth	orization to	Droceed with analysi	1			



MOBILE DIVISION

11631 \$48003/d Circle • Stamon CA 90880 (714) 891-0406 • FAX (714) 893-6709 • (800) LAB-1-CRL

Aman Brothers F.D. Box 4233 Covina, CA 91723 ATTN: Mr. Glen Stillman

BATCH:

D-185

ANALYSES:

TPH, 418.1

PROJECT: Armon Steel, Project No. 88-6004, Santa Fe Springs

Enclosed with this letter is the report on the analyses performed on samples D042788-1/9.

The samples were received by CRL in a chilled state, intact and with the chain-of-custody record attached.

Please note that ND means not detected and DL means detection limit.

Stated below are the pertinent quality control data.

Matrix: Soil

XR۱

Date	Method	Analyte	SD1 ke			PPD2	
4/27	TPH	Gasoline	112.2	119.9	pass	€.€	pass
4/27	418.1	Oil/grease	85.	79.	pass	7.	pass

* XR - per cent recovery

AFD - relative per cent difference between MS and MSD recoveries.

REVIEWED AND APPROVED

4-28-88



MOBILE DIVISION

1*631 Seaboard Circle + Starton CA 90880 17141 891-0405 + FAX: 17141 893-6709 + (800) LAB-1CPL

LABORATORY REPORT

TO:

Aman Brothers

P.O.Box 4233

Covina, CA 91723

ATTN: Mr. Glen Stillman

PROJECT:

Test:

Total Petroleum Hydrocarbons

Units: mg/kg

ANALYSIS NO. 1

DATE SAMPLED:

DATE REC'D:

BATCH:

MATRIX:

D042788-1/9 4/27/88

4/27/88 D-185

Soi 1

Armoo Steel, Project No. 88-6004, Norwalk & Los Nietos, Santa Fe Springs

Sample <u>Identification</u> Detection

Limit

Results

ARM 141

1.

ND





MOBILE DIVISION

11631 Seaboard Circle • Starter CA 90680 (7:41891-0405 • FAX. (7:14) 863-8703 • (800) LA8-10RL

LABORATORY REPORT

D042788-1/9

4/27/88

4/27/88

D-185

Soil

TOE

Aman Brothers

P.O.Box 4233

Covina, CA 91723

ATTN: Mr. Glen Stillman

Armoo Steel, Project No. 88-6004, Norwalk & Los Nietos, Santa Fe Springs .

ANALYSIS NO. 1

DATE SAMPLED:

DATE REC'D:

BATCHE

MATRIX:

Test:

418.1

Units: mg/kg

Sample Identification	Detection <u>Limit</u>	<u>Results</u>
ARM 133 8'	1.	ND
ARM 134	1.	4.
ARM 135	1.	ND
ARM 136	1.	ПD
ARM 137	1.	11.
ARM 138	1.	17.
ARM 139	1.	12.
ARM 140	1.	8.
ARM 141	1.	10.



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84-600Y	14/1000	o Stal	رخل	I dul 164	WIS HEI		GLASS PLASTIC	BRASS/SS	FUEL HG	E.	Fr	VOLATRE 624/8240	LEAD EXTRA ORGAN	5 ₹ J	
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Client AniAN Beas

Date 5/15/88

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MOBILE DIVISION

11831 Scabband Circle • Stanton CA 90680 (714) ARTANK • FAX: (714) ARTANK • (803) LAB-10RL

Aman Brothers F.O. Box 4233 Covina, CA 91723 ATTN: Mr. Glen Stillman

BATCH: D-196 ANALYSES: 418.1

PROJECT: Armed Stool, Project No. 88-6881, Santa Fo Springe

Samples D-051388-1/13.

The samples were received by GRL in a chilled state, intact and with the chain-of-custody record attached.

Flease note that ND means not detected and DL means detection limit.

Stated below are the pertinent quality control data.

Matrix: Soil

%R 1

Date	Method	Analyte		spike dup.		RPD=	
5/13	418.1	Oil/grease	105.	104.	pass	1.	pass

1 %R - per cent recovery

2 RFD - relative per cont difference between MS and MSD recoveries.

BEVIEWED AND APPROVED

5-17-88



MOBILE DIVISION

(1631 Septembilli de e Station CA 90000 (714)891-6405 e FAX (714)893-6709 e (800)(A8.40PL

LABORATORY REPORT

TOE Aman Brothers P.O.Box 4233

Covina, CA 91723

PROJECT:

ATTN: Mr. Glen Stillman

ANALYSIS NO .: DATE SAMPLED. DATE REC'D: BATCH: MATRIX:

D-051388 -1/13 U/10/00

5/13/88 D-196 Soil

Armoo Steel, Project No. 88-6004, Norwalk & Los Nietos, Santa Fe Springs

Test: 418.1

Unite: mg/kg

Sample Identification	Detection <u>Limit</u>	<u>Results</u>
ARM - 147	1.	8.
ARM - 148	1.	3.
ARM - 149	1.	2.
ARM - 150	1.	٤.
ARM - 151	1.	1220.
ARM - 152	1.	141.
ARM - 153	i.	7.
ARM - 154	1.	7.
ARM - 155	1.	22.
ARM - 15£	1.	5.
ARM - 157	1.	14.
AFM - 158	1.	926.
ARM - 159	1.	17.

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AMAN BROTFERS ENVIRONMENTAL ENGINEERING	P.OBox 4233 Covna, CA £1723 (814) 967-4287 (813) 967-4268 FA> (818) 915-3244				186	\$	HC 418.1		ORGANICS		2297	TOTAL WET.		
88-600, Ames 5	CS SAMPLER	S: (3 gnature)	SS	STIC	BRASS/SS TUB	L HC 801	PETROLEUM)	9TX 6020	VOLATRE OR	LEAD	ANICS 62	METALS		
SAMPLE MUMBER! DATE IME	SAMPLE DESCRIPTION	/FEMRKS	GLASS	PLASTIC	BRA	FUEL	PETI	BTX	VOL 624/	LEA	ORG	CAK		
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82-6501 Arma	iame	1.	hlen Stiller	35	PLASTIC	BRASS/55 TI	원 일	₹		746 240		ORGANICS 626		
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MOBILE DIVISION

11631 Seaboard Circle • Stamon CA 90560 (714) 891-0405 • FAX (714) 893-6709 • (803) LAB-10RL

Aman Brothers P.O. Box 4233 Covina, CA 91723 ATTN: Mr. Glen Stillman

BATCH:

356

ANALYSES:

418.1

PROJECT: Armos Steel, Project No. 88-6004, Santa Fe Springs

Enclosed with this letter is the report on the analyses performed an samples 051188-1/5.

CRL-Mobile

The samples were received by CRL in a chilled state, intact and with the chain-of-custody record attached.

Please note that ND means not detected and DL means detection limit.

Stated below are the participality control data.

Matrix: Soil

%R.4

Date	Method	Analyte		spike dup.		RPD*	
5/11	418.1	Oil/grease	109.	110.	pass	1.	pass

%R - per cent recovery

2 RPD - relative per cent difference between MS and MSD recoveries.

000084

Walte Beneviewed AND APPROVED

5-17- G8



MOBILE DIVISION

11631 Seabcard Carde • Starton CA 90680 (714) 891-0405 • FAX. (714) 991-6709 • (800) LAB-1071

LABORATORY

TO: Aman Brothers P.O.Box 4233 Covina, CA 91723 ATTN: Mr. Glen Stillman ANALYSIS NO.: DATE SAMPLED: DATE REC'D: BATCH: MATRIX: 051188-1/5 5/11/88 5/11/88 356

Soi 1

PROJECT

Armoo Steel, Project No. 88-6004, Norwalk & Los Nietos, Santa Fe Springs

Test: 418.1

Unite: mg/kg

Sample Identification	Detection <u>Limit</u>	Results
ARM - 142	1.	41000.
ARM - 143	1.	813.
ARM - 144	1.	11.
ARM - 145	1.	7.
ARM - 146	1.	7.

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April 15, 1988

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APPLIED GEOSCIENCES

WEST COAST ANALYTICAL SERVICE, INC.

ANALYTICAL CHEMISTS

APPLIED GEOSCIENCES, INC. 17321 Irvine Blvd. Tustin, CA 92680

Attn: Paul Roberts

JOB NO. 9296

LABORATORY REPORT

Samples Received: Ten (10) soil samples

Date Received: 4-11-88

Purchase Order No: AGI 1142/Armco

The samples were analyzed as follows:

Samples Analyzed

Analysis

Results

Three soils

Total Petroleum Hydrocarbons

by EPA 418.1

Table I

TABLE I

Parts Per Million

Sample No.	Total Petroleum Hydrocarbons
ARM 27-5-1	ND
ARM 27-9-1	ND
ARM 27-10-1	ND
Detection Limit	10

ND - Not Detected

Date Analyzed: 4

Page 1 of 1

Shelley Rinker Analytical Chemist D.J. Northington, Ph.D. Technical Director

April 15, 1988

APR 1 3 1988

APPLIED GEOSCIENCES

WEST COAST **ANALYTICAL**

APPLIED GEOSCIENCES, INC. 17321 Irvine Blvd. Tustin, CA 92680

Attn: Paul Roberts

JOB NO. 9305 ANALYTICAL CHEMISTS

LABORATORY REPORT

Samples Received: Two (2) soil samples

Date Received: 4-12-88

Purchase Order No: AGI 1142/Armco

The samples were analyzed as follows:

Samples Analyzed

Analysis

Results

Two soils

Total Petroleum Hydrocarbons

by EPA 418.1

Table I

TABLE I

Parts Per Million

Total Petroleum Hydrocarbons Sample No.

ARM 28-1-1

Ì

ND

ARM 28-2-1

ND

Detection Limit

10

ND - Not Detected

Date Analyzed:

Page 1 of 1

Shelley Rinker

Analytical Chemist

D.J. Northington, Ph.D. Technical Director

April 15, 1988

RECEIVED

APR 1 3 1988

APPLIED GEOSCIENCES

WEST COAST ANALYTICAL SERVICE, INC.

ANALYTICAL CHEMISTS

APPLIED GEOSCIENCES, INC. 17321 Irvine Blvd. Tustin, CA 92680

Attn: Paul Roberts

JOB NO. 9291

LABORATORY REPORT

Samples Received: Twenty (20) soil samples

Date Received: 4-11-88

Released for Analysis: 4-11-88
Purchase Order No: AGI 1142/Armco

The samples were analyzed as follows:

Samples Analyzed	Analysis	<u>Results</u>
One soil	Fuel Hydrocarbons by modified EPA 8015 (Luft manual 1987, P.60)	Table I
Six soils	Total Petroleum Hydrocarbons by EPA 418.1	Table II

Page 1 of 2

James Bonde Senior Chemist

WEST COAST ANALYTICAL SERVICE, INC.

Applied Geosciences, Inc. Mr. Paul Roberts Job # 9291 April, 15, 1988

LABORATORY REPORT

TABLE I

Parts Per Million

Sample No.	<u>Kerosene</u>	Mineral <u>Spirits</u>	<u>Gasoline</u>	Diesel <u>Fuel</u>
ARM25-5-1	ND	ND	ND	ND
Detection Limit	: 10	10	10	10

Date Analyzed: 4-13-88

ND - Not Detected

?

TABLE II

Parts Per Million

Sample No.	Total Petroleum Hydrocarbons
ARM25-5-1	19
ARM25-8-1	17
ARM25-9-1	13
ARM26-5-1	23
ARM26-8-1	23
ARM26-9-1	17
Detection Limit	10

Date Analyzed: 4-12-88

Page 2 of 2

April 5, 1988

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APR 06 1988

APPLIED GEOSCIENCES, INC 17321 Irvine Blvd. Tustin, CA 92680

APPLIED GEOSCIENCES



Attn: Paul Roberts

JOB NO. 9135

LABORATORY REPORT

Samples Received: Four (4) soil samples

Date Received: 3-29-88

Purchase Order No: AGI 1142/Armco

The samples were analyzed as follows:

Samples Analyzed Analysis Results

One soil Fuel Hydrocarbons by modified EPA 8015

(Luft manual 1987, P.60)

Table I

Three soils

CAM (17) metals by ICPMS

Quant Report

TABLE I

Parts Per Million

Sample No.	<u>Kerosene</u>	Mineral <u>Spirits</u>	<u>Gasoline</u>	Diesel <u>Fuel</u>	C ₁₅ -C ₃₀ +* <u>Hydrocarbons</u>
ARM 66 Detection	ND	ND	ND	ND	10000
Limit	10	10	10	10	10

ND - Not Detected

* - Heavy hydrocarbon oil; possibly tar or asphalt

Date Analyzed: 3-31-88

Page 1 of 1

B. Michael Hovanec Senior Staff Chemist D. 1. Northington. Ph.D. Technical Director

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9840 Alburtis Avenue • Santa Fe Springs, California 90670 • 213/948-2225

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APR 0'0 1.38

Client: Job Number:

Date Analyzed:

Applied Geosciences

9135

3-31-88

APPLIED GENSCIENCES

9096

33

C.A.M. Metals

Quantitative Analysis Report

Inductively Coupled Plasma-Mass Spectrometry Total Metals Concentration --- Parts Per Million

Exceeds TTLC limits

* May exceed STLC limits

	TTLC Limits mg/Kg	ARM 64	10X STLC Limits mg/Kg	Detect. Limit
Antimony	500	0.9	150	0.2
Arsenic	500	ND<12	50	12
Barium	10000	109	1000	0.8
Beryllium	75	0.3	7.5	. 0.2
Cadmium	100	0.2	10	0.1
Chromium (III/VI)	2500/500	26	5600/50	2
Cobalt	8000	10.3	800	0.05
Copper	2500	27.7	250	0.6
Lead	1000	16.3	50	0.1
Mercury	20	ND<0.3	2	0.3
Molybdenum	3500	1.42	3500	0.08
Nickel	2000	26.4	200	0.2
Selenium	100	ND<7	10	7
Silver	500	0.03	50	0.03
Thallium	700	0.12	70	0.02
Vanadium	2400	45	240	7
,Zinc	5000	107	2500	1

ND-Not Detected. The Limit of Detection is reported above.
 Chromium reported above as total chromium in sample.

Client:

Applied Geosciences

9121

^{(3) 10}X STLC Limits used as comparison takes into account dilution of the sample by 1/10 during leachate preparation.

Job Number: Date Analyzed: 9135

3-30-88

C.A.M. Metals

Quantitative Analysis Report Inductively Coupled Plasma-Mass Spectrometry Total Metals Concentration --- Parts Per Million

Exceeds TTLC limits * May exceed STLC limits

	TTLC Limits mg/Kg	ARM 65	10X STLC Limits mg/Kg	Detect. Limit
Antimony	500	1.1	150	0.1
Arsenic	500	ND<17	50	17
Barium	10000	146	1000	. 1
Beryllium	75	0.6	7.5	0.1
Cadmium	100	ND<0.4	10	0.4
Chromium (III/VI)	2500/500	37.6	5600/50	0.5
Cobalt	8000	12.1	800	0.02
Copper	2500	28	250	0.6
Lead	1000	6.07	50	0.1
Mercury	20	ND<0.3	2	0.3
Molybdenum	3500	3.51	3500	0.08
Nickel	2000	26.2	200	0.2
Selenium	100	ND<10	10	10
Silver	500	ND<0.2	50	0.2
_Thallium	700	0.17	70	0.02
Vanadium	2400	75	240	- 6
Zinc	5000	79	2500	1

ND-Not Detected. The Limit of Detection is reported above.
 Chromium reported above as total chromium in sample.

^{(3) 10}X STLC Limits used as comparison takes into account dilution of the sample by 1/10 during leachate preparation.

Date Analyzed:

Applied Geosciences

9135

3-30-88

9121 15

C.A.M. Metals

Quantitative Analysis Report

Inductively Coupled Plasma-Mass Spectrometry Total Metals Concentration---Parts Per Million

**** Exceeds TTLC limits

* May exceed STLC limits

TTLC Limits mg/Kg	ARM 67	10X STLC Limits mg/Kg	Detect. Limit
Antimony 500	1.9	150	0.1
Arsenic 500	ND<15	50	15
Barium 10000	136	1000	1
Beryllium 75	0.3	7.5	0.1
Cadmium 100	ND<0.4	10	0.4
Chromium (III/VI) 2500/500	26.6	5600/50	0.5
Cobalt 100	9.72	800	0.02
Copper (5 0	20.6	250	0.6
Lead 67 pr	12.2	50	0.1
Lead Mercury Molybdent Molybdent	ND<0.3	2	0.3
Molybdent wo Kul	1.05	3500	0.08
Nickel 2000	17.9	200	0.2
Selenium 100	ND<10	10	10
Silver 500	ND<0.2	50	0.2
Thallium 700	0.11	70	0.02
Vanadium 2400	49	240	7
Zinc 5000	60	2500	1

⁽¹⁾ ND-Not Detected. The Limit of Detection is reported above.

⁽²⁾ Chromium reported above as total chromium in sample.

^{(3) 10}X STLC Limits used as comparison takes into account dilution of the sample by 1/10 during leachate preparation.

APPLIEL

DSCIENCES INC.

SHIPMENT NO .: 3	SHIPM	ENT	NO.:	3
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Type of Preservation



Sample Number

CHAIN OF CUSTODY RECORD

Type of Container

PAGE | OF |

PROJECT NAME: ACOC

DATE 3 1291 88

Analysis Required*

PROJECT NO.: AGT 1142

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* Note - This does not constitute authorization to proceed with analysis

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APPLIED JSCIENCES INC. SHIPMENT NO .:_ 4 CHAIN OF CUSTODY RECORD PAGE OF 1 DATE 3 /30/86 PROJECT NAME: ACMCO PROJECT NO.: AGT1142 Type of Sample Type of Preservation Sample Number Location Type of Container Analysis Required* Material Method Temp Chemical 8015:8240 ARM 69 Soil Grab Stribes Steel 34* ARMLA ICQ. Total Number of Samples Shipped: Sampler's Signature: // 📿 Received By: Mille Relinquished By: Signature Pau Date 3130 188 Printed Name 1201 Kope + 15 Printed Name Time Company Applied Georgienies Doc Reason To Lab Company_ <u> تر 5 ر: ۱۵</u> Received By: Date Relinquished By: Signature_ Signature_ Printed Name_ Printed Name_ Time Company_ Company_ Reason - Date Relinquished By: Received By: Signature. Signature Printed Name Printed Name_ Time

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Special Shipment / Handling / Storage Requirements:

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Date

Time

#9141

Note — This does not constitute authorization to proceed with analysis

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APPLIED

OSCIENCES INC.

SHIPMENT	NO.:_	



CHAIN OF CUSTODY RECORD

PAGE___OF___

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ECT NAME: AMCO

DATE 4 /11/88

PROJECT NO.: AGE 1147

#9291

0	Location Type of Sample						_	_			of Pres	ervation	Т.	
Sample Number	Location		Material		Method		Type of Container		Ter	_	Chemical		Analy	sis Requirea
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* Note - This does not constitute authorization to proceed with analysis

TOSCIENCES INC. SHIPMENT NO .: 1 CHAIN OF CUSTODY RECORD PAGE___OF__ DATE 6 /2/88 PROJECT NAME: AUNCO AGI 1142 PROJECT NO.: Type of Sample Type of Preservation Location Sample Number Type of Container Analysis Required* Material Method Temp Chemical ARNIGO Stockaile 6525 Glass 340 TW <u>418.1: 8015-824</u> Total Number of Samples Shipped: Sampler's Signature: Received By Relinquished By Date Signature (1 Signature Jan Printed Name Paul Roberts Printed Name G Hailowski Time Company Applied Grasciences Inc Company WC/1)> Reason to Date Relinquished By: Received By: Signature. Signature. Printed Name_ Printed Name_ Time Company_ Company_ Reason_ Date Relinquished By: Received By: Signature_ Signature. Printed Name_ Printed Name_ Time Company_ Company_ Reason_ Relinquished By: Received By: Date Signature_ Signature_ Printed Name. Printed Name. Company___ Time Company_

Special Shipment / Handling / Storage Requirements:

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* Note - This does not constitute authorization to proceed with analysis

